

29th ANNUAL
PHOTO CONTEST
WINNERS

CANADIAN Geographic **GRIZZLY**



APRIL 2015

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HABITS AND
HABITATS

EXPEDITIONS SPECIAL
ARCTIC SNORKELLING,
A GREAT HIKE & MORE

SAVING WATER
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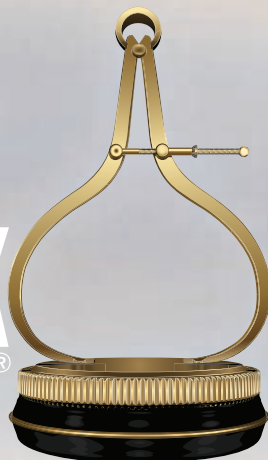
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Tanya Tagaq on the freedom and release she finds around Pond Inlet, Nunavut



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ARCTIC SNORKELLING

Go underwater with Team Sedna in this spellbinding video about their 20-day snorkel expedition from northern Labrador to western Greenland.

cangeo.ca/blog/throwback



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Canadian Geographic is turning 85! Reminisce with us as we look back weekly at some of the best of the magazine.

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PHOTO CONTEST

From famous festivals to furry fauna, see the complete list of stunning winners from our 29th Annual Photo Contest.

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ALTERNATIVE FARMING

Glimpse the potential future of fresh food production with a video tour of Urban Barns' innovative Cubic Farming facility in Mirabel, Que.

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The Royal Canadian Geographical Society gratefully acknowledges the generous support
of **Alex Trebek**, RCGS Fellow and Gold Medallist



Get out!

"YOU'RE WALKING?" said an incredulous neighbour last summer when I told her I was going to the grocery store 1.5 kilometres from our subdivision in Stittsville, a suburb of Ottawa. I often choose to take the 20-minute stroll over to the small commercial area rather than drive. But I rarely see my neighbours doing likewise.

I suspect walkers are a rarity in most of the nation's suburbs. It may be a flaw in how we've developed our surroundings. In this issue, Paul Webster explores the early research being done on this very subject in "The geography of obesity," page 56. While it's too early to definitively connect things such as the relative availability of less-healthy food options (read: fast food) or the general unavailability of healthier diet items (read: farm fresh) to the average Canadian's expanding waistline, does it really matter? We'd all be healthier if we ate healthier food and were more physically active.

We'd also get a new perspective on the places we live. There's a distinct difference in what one sees based on how you move around. When you're driving, you just can't take in the sights and sounds of the environment the same way. Indeed, this issue's story on the last leg of Dana Meise's expedition ("The Great Hike," page 34, and pictured **ABOVE**) captures elements of Canada's north one wouldn't connect with from a car.

So, this spring, get out there. You never know what you might discover.

—Aaron Kylie



To comment, please visit mag.cangeo.ca or email editor@canadiangeographic.ca.



For inside details on the magazine and other news, follow editor Aaron Kylie on Twitter (@aaronkylie).



Prolific writer, speaker and geographer **James Raffan** is a community activist and volunteer, a Fellow International of the Explorers Club and past Chair of the Arctic Institute of North America. Additionally, he is a Fellow and past Governor of The Royal Canadian Geographical Society, service for which he was awarded the Queen's Golden Jubilee Medal in 2002, the Camsell Medal in 2009 and the Queen's Diamond Jubilee Medal in 2012.

Join James as he shares stories from his new book, *Circling the Midnight Sun: Culture and Change in the Invisible Arctic*, a warm-hearted and engaging portrait of the circumpolar world, but also a deeply affecting story of societies and landscapes in the throes of enormous change.

VENUE

Wednesday, April 15 at 7 p.m.
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PHOTO BY RYAN PERUNIAK

A cougar perches in an evergreen on a steep mountainside in Waterton Lakes National Park, Alta. Ryan Peruniak had been capturing images of the big cat's tracks the day after a late-autumn 2013 snowfall, and was startled to realize the feline was watching warily from the branches of a nearby Douglas fir.



Think you've got a keen eye? Then watch for your chance to enter the Your Pets in Focus and the Canadian Wildlife Photography of the Year contests at photoclub.cangeo.ca/contests.

big picture

CELEBRATING CANADA'S GRANDEUR



exposure

SHOWCASING CAN GEO'S PHOTO CLUB



PHOTO BY MICHEL LAMONTAGNE

A field of shasta daisies edges the back roads near the village of Val Rita, Ont., about 10 kilometres west of Kapuskasing. These classic, hardy perennials begin blooming in late spring and, if their flowers are cut regularly, will continue to blossom throughout the summer.



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in a snap

SHARING CANGEEO VIA INSTAGRAM



@dawn.m.w Dawn Walker
Flock, near Archerwill, Sask.



@chris_patton_ Chris Patton
Bear crossing, Golden, B.C.



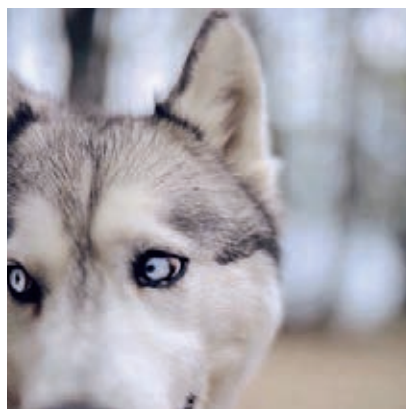
@faithroxy Roxanne Persson
Dandelion seed head near Devon, Alta.



@jchmmm Jocelyn Chmelyk
Sideways mushroom, Halifax



@nicckers Niki Pike
Stargazing near West Vancouver, B.C.



@girlnorthof7 Elle Buetow
Husky on a hike, Rattlesnake Point, Ont.



@Kraemouse Kelsey-Rae Russell
Camping, Porteau Cove Provincial Park, B.C.



@mumprj3 Shannon Black
Dall's sheep, Shubenacadie Wildlife Park, N.S.



@driedflowers Joanna Vandervalk
Sunset near Carstairs, Alta.



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Alex Trebek

One of Canada's best-known television stars reflects on his love of geography, why the subject matters and being recognized in foreign places

Alex Trebek, the host of *Jeopardy!*, recently donated US\$100,000 to The Royal Canadian Geographical Society.

INTERVIEW BY HARRY WILSON

He'll take geography for \$1,000, every time. Alex Trebek, the host of *Jeopardy!*, has long been an aficionado of the subject, having hosted the U.S. National Geographic Bee for 25 years and the Canadian Geographic Challenge (formerly known as the Great Canadian Geography Challenge) eight times since its inception in 1995. Trebek's recent US\$100,000 donation to The Royal Canadian Geographical Society means that 20 of Canada's brightest grade 7-10 geography students will be in Ottawa May 2-4 to compete, the first time the challenge will have been held live since 2002.

On his interest in geography

It was my favourite subject in primary school, and it has stayed with me all my life. When people in the studio audience who are at our tapings ask me about my favourite *Jeopardy!* categories, I usually include geography. If you know geography, then you

know why civilizations developed where they did, why conflicts arose and what the potential for different areas was. It covers everything, really. When I was a kid, though, it was probably because I enjoyed colouring maps, mostly of Africa. It had the most countries and was mysterious. Asia was exotic, of course, but Africa had the animals, the pygmies, the cannibals! It had everything a young boy would be fascinated in.

On the state of geographic education

I'm disappointed that it's no longer as important as it was when I was in school. It has been shunted aside, I think, because it's thought of as a nebulous kind of study. People say, as they do for my degree in philosophy, "What does it prepare you for?" I tell them it prepares me for life. It's too bad, because there isn't any subject that doesn't have a geography aspect to it. I wish our politicians would agree with that

point of view and decide to emphasize geography in education a little bit more.

On being recognized far from home

It was in the late 1960s, and I was just outside Kathmandu, Nepal, at about 5 a.m., taking a private ride with a guide to a peak where we could watch the sun rise over the Himalayas. While we were standing there, I noticed a lone figure walking along the ridge toward us. When he got closer, he stopped and pointed at me and said, "Are you Alex Trebek, the host of championship curling on the CBC?" I said, "Yeah, that's me." He was Canadian, of course, and just happened to be there hiking. He was amazed to see me, and I was amazed to be recognized.



Want to test your geography smarts? Try answering 10 questions from past Canadian Geographic Challenges at mag.cangeo.ca/apr15/challenge.

Cubic Farming

Montreal-based Urban Barns is leading a fresh-produce revolution

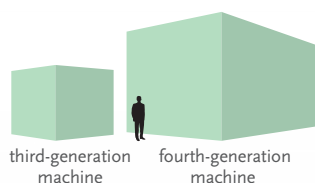
By Nick Walker

Rows upon rows of flawless lettuce, basil and microgreens slowly, mechanically circulate under thousands of LEDs in a sterile, controlled indoor growing system in Urban Barns' "Cubic Farming" facility in Mirabel, Que. These greens haven't been genetically modified or even sprayed with anything but fresh water, yet Urban Barns' yields are as much as 280 times higher than an equivalent area in a field.

Founded in 2009, the company moved to Quebec from British Columbia in 2012, and by 2014 its 1,500-square-metre centre (the world's first commercial cubic farm) was producing. Now, researchers from

McGill University's Bioresource Engineering program collaborate with Urban Barns to improve LED wavelengths, plant selection, nutrition and more. The veggies are delivered to restaurants and hotels around Montreal (such as the Ritz-Carlton and Hyatt Regency) and distributed to supermarkets in southwestern Quebec and eastern Ontario.

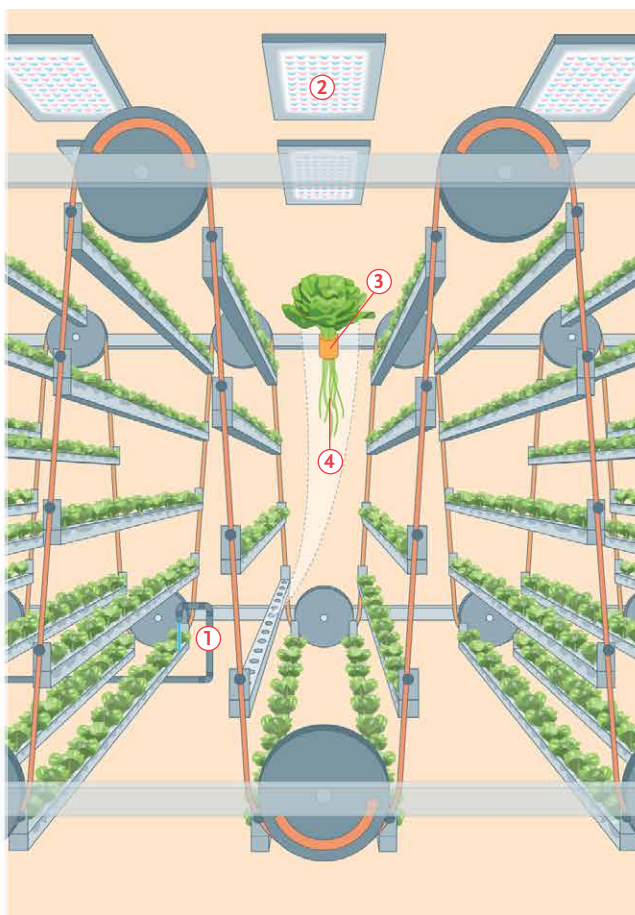
This might well be an early glimpse into the future of fresh food, what Urban Barns CEO Richard Groome calls "a revolution in farming, food availability and production stability and sustainability." This graphic shows how Urban Barns is growing ideal greens at never-before-seen rates.



Urban Barns will soon be relying on its new, larger fourth-generation Cubic Farming machines, but regardless of version, all machines are essentially metal frames filled with growing trays raised and lowered on pulleys and cables. This enables multilevel production and ease of planting and harvesting. The modular machines can be lined up and height can be added to fill the shape and volume of any growing space.

WATER

Growing trays are irrigated with one 50-millilitre shot of nutrient-rich liquid per cycle (each cycle being 45 minutes to two hours long, depending on plant requirements). Excess water is drained and recollected, rebalanced and recirculated across the system. Virtually no water and nutrients are wasted.



LIGHTS

Red, amber and blue LEDs (about one for every two square centimetres per light panel) provide the best-known light spectrum and ratio for growing plants. Plants receive this light for about 12 hours each day. The new machines are up to six metres high, so "inter-canopy" rather than overhead LED panels are now necessary, with three to seven light-bars spaced throughout the machines (not shown).

SUBSTRATE

Crops are currently seeded and grown in plugs made from a soil substitute called rockwool, a fabric-like material of mineral fibres. McGill researchers are testing several biological substrates, such as coconut core, which unlike rockwool is biodegradable.

NUTRIENTS

Greens are fed a balanced hydroponic mix of minerals and elements: nitrogen, phosphorus, potassium, sulphur and calcium. Nutrient amounts can be adjusted on a per-species basis.



Take a video tour of the Urban Barns facility and meet some of the people who work there at mag.cangeo.ca/apr15/farm.

PRODUCTION

Heads of lettuce per square metre per year

Traditional field: 18 per m²
Greenhouse: 215 per m²
Urban Barns: 5,110* per m²

*Output of fourth-generation machines: each square metre of space can produce roughly the equivalent of 280 m² of land (the size of 21 parking spaces).

WATER USAGE

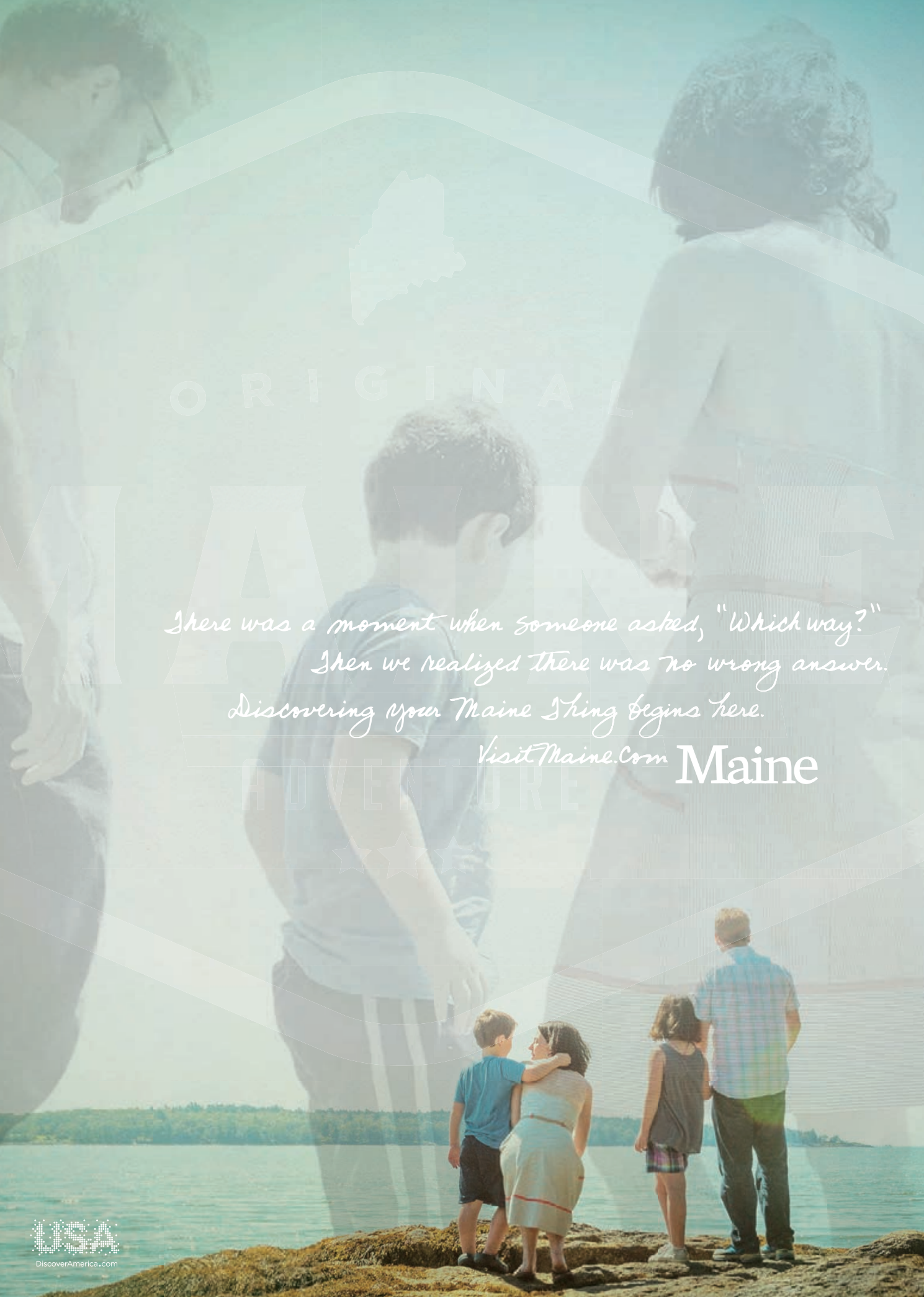
In 2010, the average vegetable crop in Canada received about 87 litres of irrigation water per square metre. Urban Barns' fourth-generation machines (each about 30 m²) consume around 3,000 litres per m² per year, but thanks to a production rate much greater than that of a field and other water-saving measures, consumption is cut back by 94 per cent.

PESTS

Pesticides are routinely applied to both traditional crops and in greenhouses in Canada. By adhering to strict control standards, Urban Barns is pesticide-, fungicide- and herbicide-free, resulting in cleaner, safer and more nutritious food. Lab coats, shoe-covering booties and hairnets are worn and outside plants must not be handled for 24 hours before work.

SHIPPING

Most supermarket greens are long-haul shipped to Canada from California, Arizona or Mexico, spending four to 10 days in transit. Urban Barns' veggies are picked between 8 a.m. and noon and are on plates across Montreal by 5 p.m. or 6 p.m. Vegetable longevity is maximized; greenhouse gases emitted in transit are minimized.



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ADVENTURE





“The Oak Ridges Moraine,”

says Bill Lishman, “is the defining geological feature of south-central Ontario. It needs rock-star status.” Lishman, whose exploits guiding migrating Canada geese from his ultralight aircraft were the inspiration for the film *Fly Away Home*, sets out to attain that recognition for the 1,900-square-kilometre stretch of land reaching from the Trent River in the east to the Niagara Escarpment in the west, with his book *The Oak Ridges Moraine From Above*. Featuring about 200 colour photographs (including this one of mist-shrouded trees in Clarington Township, which is just east of Oshawa), the book will be released on Earth Day, April 22. For more information, visit williamlishman.com.



“ So ... it’s gonna take two presidents & a prime minister to save the greatest of monarchs. Fate of butterfly depends on US/Can/Mex leadership. ”

@WWFnews tweets after a recent survey showed a 69 per cent increase in the wintering-ground area occupied by monarch butterflies in Mexico in December 2014, with the insects covering 1.13 hectares. The previous year, only 0.67 hectares were covered, the smallest area since 1993, when record keeping began. About two weeks after the survey was released, the United States unveiled a \$2-million plan to help save the monarch by growing milkweed and other butterfly-friendly plants along migration routes from Minnesota to Mexico. In February 2014, Prime Minister Stephen Harper, President Barack Obama and President Enrique Peña Nieto committed their nations to protect monarch butterfly migration across North America.



5 THE NUMBER OF YEARS the British Columbia government expects a contentious wolf cull in the province to last. The government says the wolves, which are being shot from helicopters in the

South Selkirk Mountains and the South Peace region, threaten the recovery of the endangered mountain caribou. Most conservation groups, meanwhile, say the cull is cruel and unnecessary, and that habitat loss and human encroachment are the main reasons caribou numbers have plummeted. The southernmost herd in the Selkirk Mountains region numbers 18 animals, down from 46 five years ago. About 180 wolves were expected to be culled during the winter of 2014-2015.



Read more about each of these stories and see more of Bill Lishman’s photos of the Oak Ridges Moraine from above at mag.cangeo.ca/apr15/wildlife.



SAFE WATERS

Dolphins, walruses and orcas are just a few of the creatures that will benefit from stronger protection after the Ontario government announced it would overhaul the rules governing the care of captive marine mammals. In addition to creating new rules for things such as water quality, noise levels, lighting conditions and pool size by July, Community Safety Minister Yasir Naqvi is expected to table laws that will ban the future breeding and acquisition of orcas. If everything goes according to the government’s plan, Ontario will be the first province to set specific standards of care for marine mammals.

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 Columbia

A two-wheeled revolution

How the late Victorian-era passion for all things bicycle-related changed Canadians' relationship with the countryside and each other

By Harry Wilson*



PERHAPS THE *NEW-YORK TRIBUNE* was employing hyperbole when it proclaimed in June 1895 that “The discovery and progressive improvement of the bicycle is of more importance to mankind than all the victories and defeats of Napoleon, with the first and second Punic wars ... thrown in.”

At the time, however, the bicycle was riding a crest of popularity in North America — a so-called “bicycle craze,” in fact — thanks in part to the advent of the pneumatic-tire safety bicycle, which was more comfortable to ride than its predecessors: the boneshaker, the highwheeler and the hard-tire safety bicycle, the names of which give some idea of their discomforts and perils.

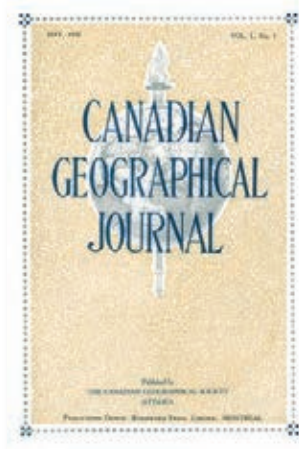
The popularity of cycling in the 1890s was such that a spinoff industry of bicycle accessories arose. Cyclists bought tools, clothing, lamps, locks and, of course, maps, such as the one from 1894 pictured here, which shows bike-passable roads for “60 miles around Toronto,” (roads and concessions that were impassable by bicycle are not plotted) as well as railways, post offices and the populations of towns and villages.

In his book *The Ride to Modernity: The Bicycle in Canada, 1869-1900*, Glen Norcliffe writes that the many maps drawn specifically for cyclists were an indication of their interest in touring the countryside, something they could do with greater ease from their urban homes on a bicycle (in good weather, anyway) than by either walking or horse and buggy.

The result, writes Norcliffe, was that “the bicycle changed the meaning of the place called ‘countryside,’ producing a new space that included out-of-town hotels where cyclists could spend the night on a weekend ride.”

By the start of the 20th century, however, the two-wheeled craze had started to fade as Canadians turned their attention to the automobile, a vehicle that would prove to take them even farther, faster. Still, the “geographically liberating” bicycle, as Norcliffe calls it, had laid the groundwork, helping redefine the geography of personal space.

*with files from Sara Viinalass-Smith, early cartographic archivist, Library and Archives Canada



FOR THE RECORD

A look back through the archives as *Canadian Geographic* turns 85

Volume I, Number 1 of *Canadian Geographical Journal* was 106 pages and cost just 35 cents.

It was May 1930, and as *Canadian Geographical Society* founder Charles Camsell wrote then, it was “highly desirable that the people in each part of our country should become better acquainted with the conditions, the culture and the people of every other part.”

The magazine’s debut featured a story by Frederick Banting, the co-discoverer of insulin, called “With the Arctic Patrol,” with sketches and paintings by Banting and the artist A.Y. Jackson. The two had sailed through the Arctic together in 1927 on a government expedition.

Add to that “The Camera Takes to the Air,” about the post-First World War use of aerial photography in Canada, and the richly illustrated “Some Canadian Birds” and “Arctic Wild Flowers,” and Canada was well represented.

But the editors also insisted they would publish articles devoted to “geography in other parts of the world,” which perhaps accounts for the inclusion of then-Governor General of Canada Viscount Willingdon’s tale of his 1930 tour of the British West Indies, which the dazzled viceroy described as the “Sun room of the Empire.”

Eighty-five years later, content is typically more Canada-centric than that first printing, as *Canadian Geographic* (the name was shortened in 1978) continues to endeavour to — as first editor Lawrence J. Burpee wrote in 1930 — “make the resources of Canada, economic as well as aesthetic, better known both at home and abroad.”

—Nick Walker



See a larger version of this map and more Canadian bicycle maps from the late 1800s at mag.cangeo.ca/apr15/bike.



Read more stories from the magazine’s archives at cangeo.ca/blog/throwback.

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WHEN IT COMES
TO CLEAN
THERE'S
ONLY ONE
Mr.

Look up, way up

The CN Tower still inspires wonder 40 years after it laid claim to the title of world's tallest freestanding structure

By Aaron Kylie



“SO I GUESS YOU’D LIKE TO KNOW how high you are,” says the guide as guests step out onto EdgeWalk, the circular 150-metre metal platform that sits above 360, the CN Tower’s revolving restaurant.

At 356 metres high (116 storeys) — a measurement that makes it the “highest external walk on a building,” according to Guinness World Records — EdgeWalk is the latest planetary best claimed by the 553.33-metre-tall tower, which first gained international attention 40 years ago when it became the world’s tallest freestanding structure on April 2, 1975 (a title it held for almost 32 years, until 2007, when the Burj Dubai replaced it). The EdgeWalk is just one of the latest ways to experience both the tower and the city views it offers.

Opened nearly four years ago, EdgeWalk sees groups of six people individually attached to an overhead safety rail via a trolley and harness system guided around the 1.5-metre-wide platform. Looking up from

the platform nearly another 200 metres to the tower’s tip is dizzying, as is looking down to its base. Along the tour, EdgeWalkers get a bird’s-eye view of Toronto’s landmarks, from Billy Bishop Toronto City Airport and the nation’s tallest *building*, First Canadian Place, to Casa Loma and, on a clear day, Niagara Falls — all looking like miniatures in a model city.

Of course, the same landmarks, and many more, can be seen from inside the tower, whether it’s from the SkyTerrace and Glass Floor (342 metres), the LookOut level (346 metres) or the SkyPod (447 metres). Each observation site is also a unique part of the building’s architectural legacy, which includes being recognized as one of the Seven Wonders of the Modern World by the American Society of Civil Engineers in 1995. Today, four decades after its 40-month construction ended, Canada’s National Tower is still reaching new heights.



No acrophobia? No problem! Visitors to the CN Tower (ABOVE) show no fear on the 356-metre-high EdgeWalk (TOP LEFT).



Get a bird’s-eye view of Toronto by watching a video of the CN Tower’s EdgeWalk experience at mag.cangeo.ca/apr15/cntower.

GAME READY

WITH
HEATHER AND MARTIN ST. LOUIS

We had the chance to sit down with NHL® great and Olympic gold medalist Martin St. Louis and his wife Heather while they were in Toronto recently. Here are the top things that Heather and Martin St. Louis need to be game ready.

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MY DAY STARTS WITH
Coffee.

FAVORITE FAMILY TIME

Other than dinner, family time typically involves some form of physical fitness. We try to bike ride or play tennis as a family whenever Martin's schedule allows.



MY FITNESS REGIMEN

We have always shared a commitment to being physically fit. Once lunches are made and the kids are at school, I'm out walking the dogs, taking a fitness class or going for a long run.



MUST HAVE

Lip balm. As far as my day-to-day beauty regimen is concerned, I'm pretty low maintenance. But if you ask anyone who knows me, I'm never without my lip balm.



MY DAY STARTS WITH
Coffee.



FAVORITE FAMILY TIME

Every summer we take the boys back to Quebec. I think it's important for them to spend time with my family and see where I grew up.



MY FITNESS REGIMEN

I've always loved working out. Obviously it's an important aspect of me being a professional athlete, but I really do enjoy it. Weights, cardio – it's a ritual for me.



MUST HAVE

Crest® SENSI-RELIEF™. I suffer from tooth sensitivity, especially from anything cold. Ironical since I spend so much time on the ice. Brushing with Sensi lets me worry about the cold less, and focus on the game more.



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Testing for Trichinella

INUIT HUNTERS AND SCIENTISTS WORK TOGETHER TO ENSURE WALRUS MEAT IS SAFE TO EAT

BY JOHN BENNETT

Walrus have been a source of meat for people in Canada's North for generations, and a long-running screening program is helping make sure the animal is safe to eat.

WALRUS MEAT — cooked, raw or fermented in cool dry Arctic gravel to make *igunaq*, which tastes something like blue cheese — is among the local foods enjoyed in many of Canada's Inuit communities. Like pork, though, walrus can occasionally carry the *Trichinella* parasite. If not cooked thoroughly, infected meat can bring on trichinellosis, a disease that causes swelling, muscle pain and fever and chronic gastrointestinal troubles.

Trichinella is a tiny nematode that's impossible to spot with the naked eye. But thanks to the Nunavik Trichinellosis Prevention Program, lovers of raw walrus meat and *igunaq* across Arctic Quebec can enjoy the traditional food with full confidence that it's safe to eat.

The program, which has been operating for more than 20 years out of the

Inuit-owned Nunavik Research Centre in Kuujjuaq, Que., works with hunters to screen their walrus meat. The process is simple and efficient. After butchering a walrus, the hunter removes the tongue, packages it using a sampling kit the centre provides, and puts it on

'It's a very successful program. It's easy to use and gets results.'

the next flight to Kuujjuaq. The hunter then tags all pieces of the meat so they can be identified with that particular animal, and sets them aside. Until the test results arrive, the meat can only be eaten if it is well cooked.

Once in Kuujjuaq, the sample goes to the research centre, where a parasitologist uses a protocol developed

with the Canadian Food Inspection Agency to test it for *Trichinella*. The results are sent back to the community within 24 hours. If the meat is free of the parasites — as is most often the case — it may safely be eaten raw or made into *igunaq*. If it's infected, however, it must only be eaten if thoroughly cooked and cannot be consumed raw, even by dogs.

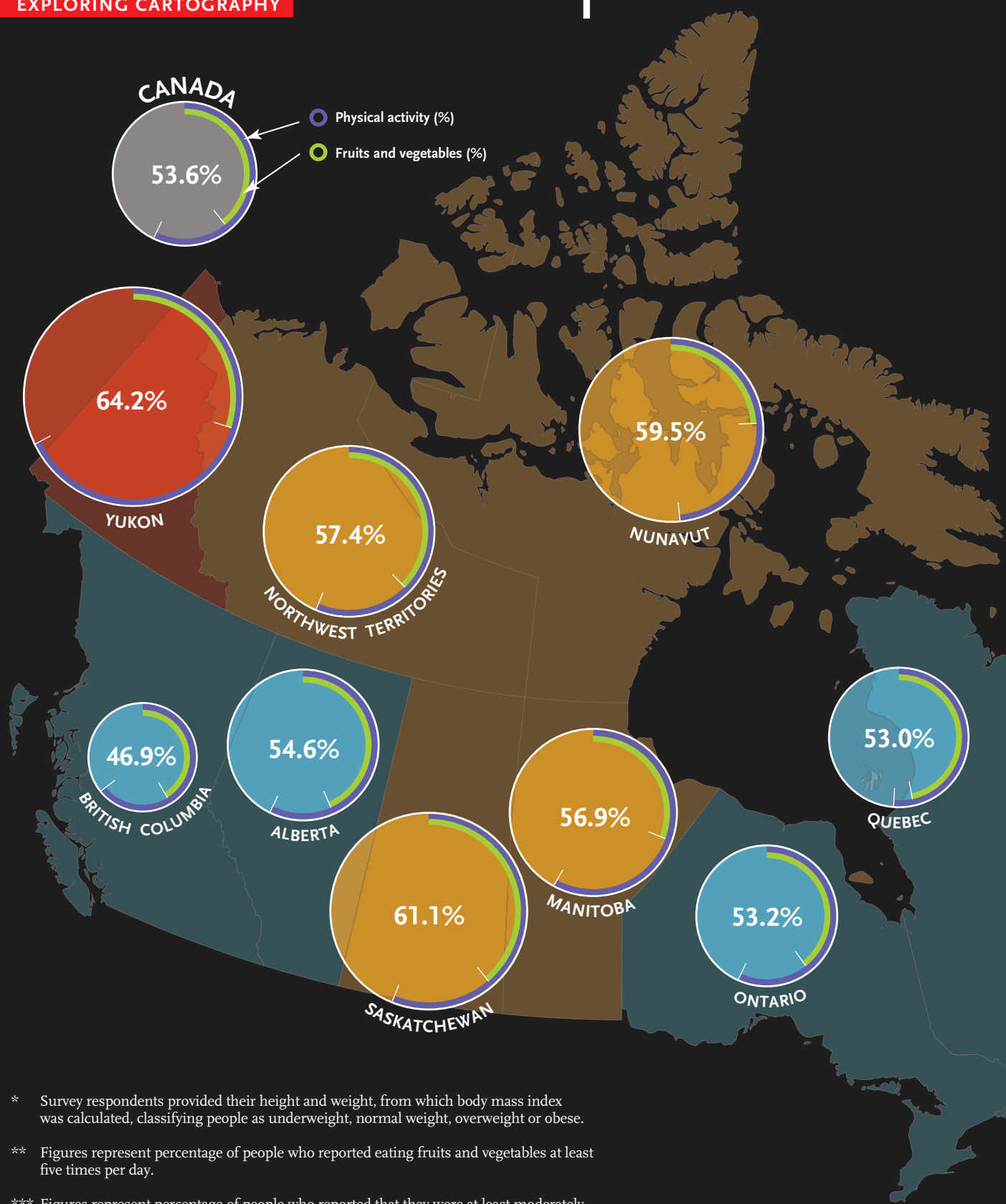
"It's a very successful program," says Barrie Ford, a wildlife biologist at the centre and a lifelong resident of Kuujjuaq. "It's easy to use and it gets results. In the 1980s there were walrus-linked trichinellosis outbreaks every other year or so in Nunavik, but those are a thing of the past now. It's a great example of community-based science that serves local needs."



This is the latest in a continuing blog series on polar issues and research presented by *Canadian Geographic* in partnership with the Canadian Polar Commission. The Polar Blog appears online every two weeks at cangeo.ca/blog/polarblog, and select blog posts are featured in this space in each issue. For more information on the Canadian Polar Commission, visit www.polarcom.gc.ca.

on the map

EXPLORING CARTOGRAPHY



* Survey respondents provided their height and weight, from which body mass index was calculated, classifying people as underweight, normal weight, overweight or obese.

** Figures represent percentage of people who reported eating fruits and vegetables at least five times per day.

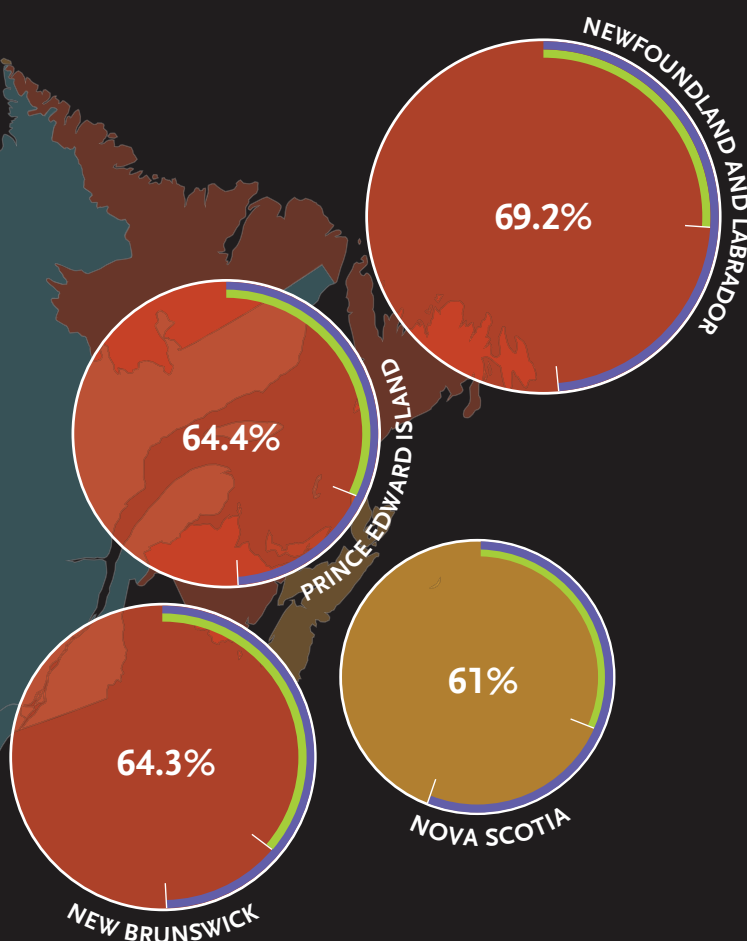
*** Figures represent percentage of people who reported that they were at least moderately active, equivalent to walking at least 30 minutes a day or taking an hour-long exercise class at least three times a week.

A weighty matter

Charting the percentage of Canadian adults who are overweight or obese

BY CARYS MILLS AND HARRY WILSON

PROVINCE	* Overweight or obese (%)	** Fruit and vegetable (%)	*** Physical activity (%)
Newfoundland and Labrador	69.2	25.5	47.6
Prince Edward Island	64.4	32.5	48.4
New Brunswick	64.3	35.9	49.6
Yukon	64.2	32.6	66.1
Saskatchewan	61.1	38.4	54.5
Nova Scotia	61.0	33.3	55.8
Nunavut	59.5	23.3	47.4
Northwest Territories	57.4	37.5	56.7
Manitoba	56.9	31.9	56.6
Alberta	54.6	42.1	56.9
CANADA	53.6	40.8	55.2
Ontario	53.2	39.4	54.2
Quebec	53.0	46.9	51.8
British Columbia	46.9	40.7	64.0



Is it something in the water, British Columbia? It's a rhetorical question for the province where just 46.9 per cent of adults (18 and older) were classified as overweight or obese* in 2013 — but one that you could also ask Newfoundland and Labrador, where 69.2 per cent of adults were classed as such.

The two provinces are at the low and high end on this map, which shows the percentage of adults in each province and territory that are either overweight or obese, according to the most recent results from Statistics Canada's Canadian Community Health Survey. The annual survey collected information from about 65,000 people about their health, the factors that determine it and their use of health-care services.

So why do differences such as those between the coastal counterparts exist? "We can't say why," says Amanda Wright, a Statistics Canada analyst. "But you can look at it in the context of other health behaviours."

Two of these behaviours — the consumption of fruits and vegetables** and physical activity during leisure time*** — are included in the more than 30 health indicators used in the survey, and the proportions of people who engage in them appear on the map and accompanying table to provide some context.

There are countless other behavioural factors at play, including smoking and heavy drinking. And, as the "Geography of obesity" story on page 56 explains, where you live, how you get around, access to healthy food and your income level can also affect your weight.

More than half of Canadians (53.6 per cent) are overweight or obese, conditions that can have an impact on health. Obesity — the measured rates of which roughly doubled among adults in most age groups between 1981 and 2009 — is an especially serious concern, not only for the individual but also for the economy. A 2011 federal government report pegged economic costs, based on the eight chronic diseases most consistently linked with obesity, at \$4.6 billion in 2008, up about 19 per cent from eight years earlier.



Learn more about data from the Canadian Community Health Survey and overweight and obesity rates in Canada at mag.cangeo.ca/apr15/data.



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The Expeditions

THE GREAT HIKE 34



PROJET KARIBU 37



SEDNA EPIC 38



Highlights of the 2014 expeditions
funded by The Royal Canadian
Geographical Society

The great hike



Dana Meise tackled the northern extent of the Trans Canada Trail — from Fort Saskatchewan, Alta., to just north of Whitehorse — in 2014. Along the way he shared his experiences on social media. Here's an edited selection of highlights from his journey.

COMPILED BY SABRINA DOYLE



Grande Prairie, Alta., **March 3**

In 2006 my Dad suffered a severe stroke and lost his ability to walk. He loved to explore and travel, especially in Canada. So I told him I'd walk enough for both of us. It was then that I decided to hike the Trans Canada Trail. Since then I have hiked 16,500 km across Canada, through more than 900 communities, taking 26,400,000 steps. This April, I will walk more than 4,000 km from Fort Saskatchewan, Alta., to Inuvik, N.W.T., via the Trans Canada Trail.



just north of Fort Saskatchewan, Alta., **April 17**

First 10 km done and I'm already making friends. I'll name this one "Partner" as it looks like it's coming with me.

near Smith, Alta., **April 29**

Only walked 15 km yesterday because the trail is flooded. Water got in my boots, and wet feet cause blisters, so I'd switch socks often, then attach the wet ones to my pack to dry. Some of the mud was so thick and heavy that I'd sink in, stopping dead. It was, and is, tremendously exhausting.



Lesser Slave Lake, Alta., **May 5**

Canada has more lakes and rivers than the rest of the world combined. I can't help but think of this as I sit on the shore of Lesser Slave Lake. David Thompson was one of the first Europeans to explore the area back in 1799. Following his exploration, several fur trading posts were established around the lake. The groomed trail soon ends, and then I'm on my own. I'll be following the old Freighter Lakeshore Trail, which is both a continuation of the Peace River Trail and part of the Trans Canada Trail. The forecast is calling for one to three centimetres of snow tonight.

MARCH

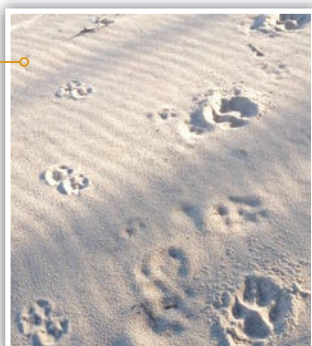
APRIL

MAY

MAY

near Lesser Slave Lake, Alta., May 7

I climbed up and down hills through coniferous plantations, ultra-dense aspen, alder and willow. I crossed countless creeks and sank in the marshes too many times to count. I tried walking on the ice when I could. Keeping my feet dry just wasn't possible, and I had to pull some blistered skin off. Seventeen km was all I could walk, and it took me 11 hours. Once again I found myself following wolf and bear tracks. It was nice to know I wasn't alone.



Eggleham, Alta., May 16

I talked to the cool kids at the local school, which was a blast. The Royal Canadian Geographical Society sent me their flag, so Eggleham was the first community that got to sign it. Whoever signs it does so on the condition that they promise to take genuine interest in our country and share all they learn. I look forward to sharing my journey as I continue northward. Knowing you're all with me takes some of the loneliness away.



Hines Creek, Alta., May 27

I haven't walked for two days. My feet were horribly swollen and ached badly. What makes it worse is when I'm not walking, the loneliness hits home really hard. I always feel guilty when I don't walk, but sometimes I just can't. But I'm going to walk today and do what I can.

north of Hines Creek, Alta., May 28

It's only 1 C this morning, but I'm greeted with as beautiful a sunrise as I've ever had the pleasure to see. Mosquitoes here would freeze to death if they weren't as big as birds.



near Grimshaw, Alta., May 20



Peace River, near Rolla, B.C., June 10



near Worsley, Alta., June 1

It's official. I'm in grizzly country once again.



Dawson Creek, B.C., June 17

near Kiskatinaw Provincial Park, B.C., July 29

Did I mention it was hot? I had to stop every five km today to rest in the shade, drink water and dry my boots and socks. At one point, I stopped at a house where the owner let me lie in his backyard in the shade.



Fort St. John, B.C., July 30

How cool is this? I'm at my 18,000th kilometre on my 40th birthday. It also just happened to be right at the Canadian Grind coffee shop in Fort St. John. I had received a message on my Facebook page from the owner inviting me for a snack and drink. I arrived to find they had an orange cream muffin ready for me with a candle. All the staff sang me Happy Birthday.

JUNE

JULY

AUGUST

near Prophet River Wayside Provincial Park, B.C., **Aug. 21**

Yesterday began warm and sunny, but in the distance I could see a storm brewing. I was hoping it would miss me, but 10 km into my day it was nearly upon me. I could actually see the wall coming. I decided to wait this one out, so I scrambled up a hill and quickly pitched my tent, climbing in just in time.



near Watson Lake, Yukon, **Oct. 2**

Today I met a man who sat with me at a picnic table outside the Sign Post Forest. He was clearly drunk. He told me he was sad. He told me he saw me walking and was wondering why. I told him, but he couldn't quite comprehend. He repeated this question over and over. I don't think it was because he was drunk, but rather because he couldn't understand my reasons. He tells me he wouldn't do what I do without a weapon. I tell him we are all going to die one day, but it is how we choose to live that matters.

Fort Nelson, B.C., **Aug. 31**

I will only be able to update via my DeLorme inReach [which sends texts via satellite] for the next two weeks. I'm actually afraid to be alone for that long. The next stop with service is Watson Lake, Yukon. It will be a nice 520-kilometre walk.



Tetsa River Lodge, B.C., **Sept. 9**



Big Creek Campground, Yukon, **Oct. 22**

My eyes open and it's light out. I panic. I was supposed to get up at 5 a.m. Why didn't my alarm go off? I grab my phone and see it's dead. The temperature had dropped, and my phone had frozen. I hastily pack and clean up. I pull out of the park to a bright sunny day. The cold, crisp air is a revelation. It's been cloudy and either raining or snowing for 10 days. My heart fills with joy and excitement. What a glorious day.

SEPTEMBER

near Steamboat, B.C., **Sept. 3**

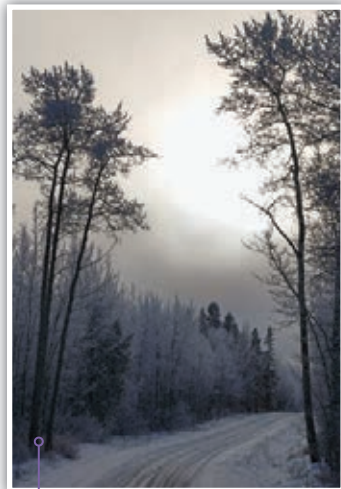
Surprise! I've got cell service. The old gas station at Mile 351 of the Alaska Highway is a bygone place with a great view. Many of these long highways are littered with this type of place. Many old gas stations become camps for workers and travellers. But eventually the buildings get old, repairs too costly and the doors close.

east of Coal River, B.C., **Sept. 16**

Just took my 30,000,000th step. Saw lots of bison with creepy glowing eyes staring at me today. I'll try to sleep, but wolves are close, howling really loudly.



Muncho Lake, B.C., **Sept. 10**



near Carcross, Yukon, **Nov. 11**

Just north of Carcross, heading to Whitehorse, there is a desert. Yes, a desert. The surrounding mountains hoard all the rain so these sand dunes only receive about 50 millimetres of rain a year. At about 1.6 square km, it's the self-proclaimed "Smallest Desert in the World."

20 kilometres north of Whitehorse, **Nov. 28**

It's with a heavy heart that I have to end my season for safety reasons. There was much at stake and the dangers outweighed the reward. I'll be back next year to do what I promised my dad and all of you. This is not quitting, it's simply postponing the inevitable.

NOVEMBER

Given the extreme weather conditions on the trail north of Whitehorse in the late fall and the lack of a sufficient support vehicle, Meise postponed the completion of his trek until this coming spring.

OCTOBER



Read Dana Meise's reflections on his triumphs and trials along the Trans Canada Trail in 2014 at mag.cangeo.ca/apr15/meise.

Projet Karibu



A team of cross-country skiers treks from Montreal to Kuujuaq in northern Quebec to celebrate nature and winter

BY NICK WALKER



LIKE MORE THAN A FEW GREAT undertakings, Projet Karibu was sparked by a tale heard in a bar. Jacob Racine, a Gaspésie-based outdoor adventure guide, was having beers with 15 other guides in 2011 when then 52-year-old Claude Duguay shared the astonishing story of his little-known Expédition Québec 80 (as in 1980), during which he and four others cross-country skied the 2,000 kilometres from Mont-Tremblant to Kuujuaq in Nunavik, northern Quebec.

Racine was moved to try to do the same. “And I wanted to tell people in Canada that this unbelievable thing had been done — to make a real tribute,” he says, adding that the object of the trek was to film a documentary while celebrating the beauty of Quebec and winter, reminding Canadians of the importance of staying physically active. He recruited three other outdoor guides, all Quebecers: Bruno-Pierre Couture, who crossed Baffin Island’s Auyuittuq National Park with Racine in 2012, Marie-Andrée Fortin and Sébastien Dugas.

Projet Karibu was gliding north (from Montreal) by Dec. 27, 2013, picking up

the odd cross-country skier for short stretches along the way. “We wished to invite as many people as possible to join in our trip,” says Racine. “If someone wanted to ski with us for an hour, a day or a week, they could. That was our *karibu* welcome.” The name, he explains, stands for both one of the North’s most symbolic animals and the Swahili word for “welcome.” (Dugas had recently climbed Mount Kilimanjaro, in Tanzania, and the group thought the term was fitting.)

Dragging 70-kilogram food-and-supplies sleds, the team went north toward enduring winter. It was warm and raining in southern Quebec in early January, and because of a proliferation of private land since 1980, Racine and company had to pick their way around those holdings instead of blazing more direct trails through forests, often using rocky, sled-scraping logging roads.

North of Chibougamau, however, snow was heavy and the expedition members did not encounter another human (save for one small group of Cree hunters on snowmobiles) until the expedition’s end. And the temperatures dropped. For 24 days in March, it was

never warmer than -40 C. A few nights, says Racine, when the thermometer was reading -56 C, “It was so cold, the tree branches in the woods all around us were exploding, cracking like gunshots as sap froze.”

On May 5, the Projet Karibu skiers slid into Kuujuaq, about 50 kilometres south of Ungava Bay. “Somehow, that final morning felt just like the 130 before it,” says Racine, “But it was Couture who said to us all, ‘Just take time. Think about how this is the last time you’ll fold up your tents, put your sleeping bags into your sled, put your skis on.’”

On the plane back to Montreal, the team looked down on their route — a stretch that took them more than four months to cross — as it whizzed by in 2½ hours and winter turned suddenly into spring. “Winter,” says Racine, “is such an important part of our life. We should be grateful to have it. We wanted to prove to people that we could sleep outside for a whole winter — and we didn’t just survive, we *lived* it.”



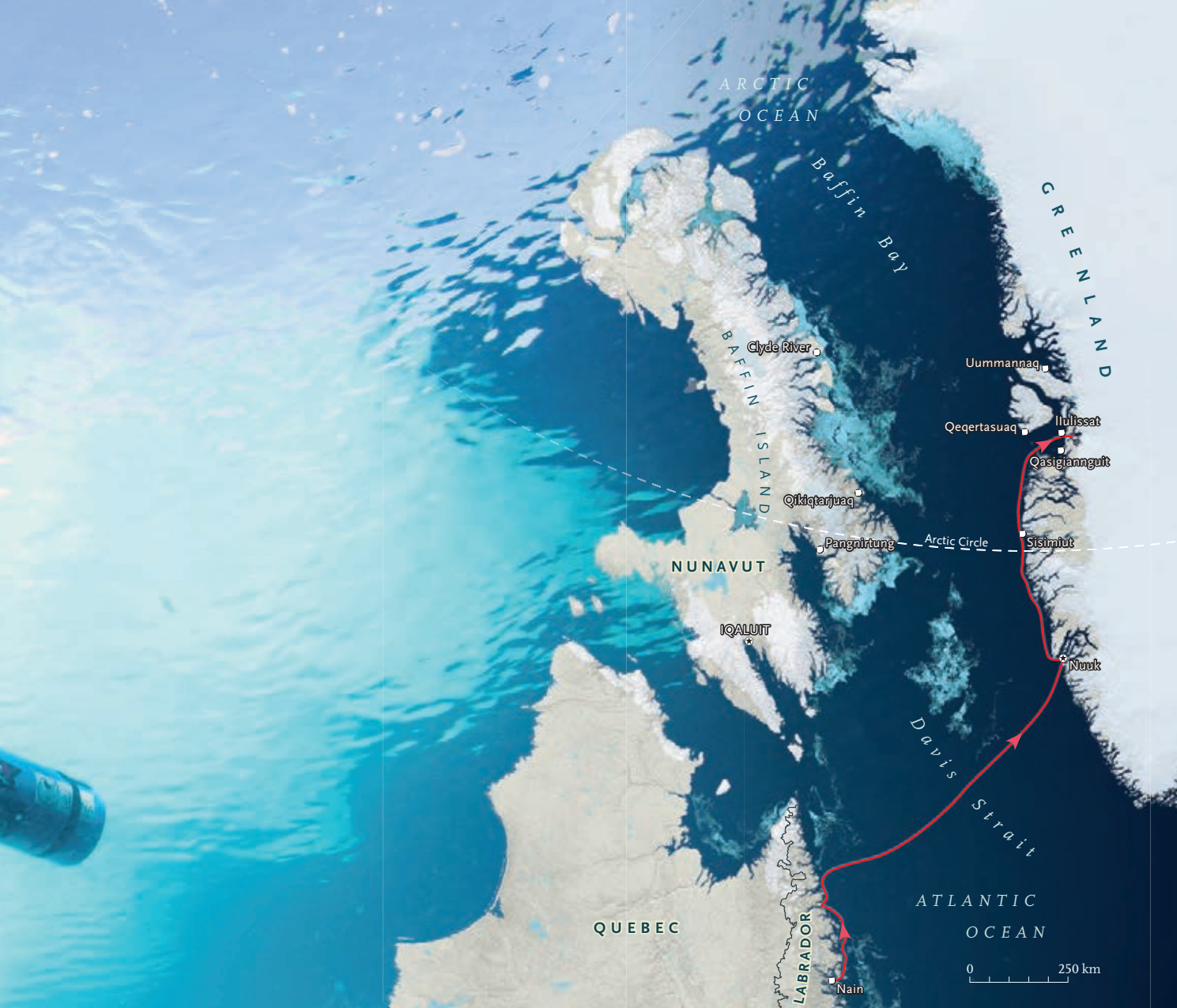
See more photos from the Projet Karibu expedition at mag.cangeo.ca/apr15/karibu.



Sedna EPIC

An all-woman team
snorkels Arctic waters
to raise awareness
of climate change

BY SUSAN R. EATON
PHOTO BY JILL HEINERTH



TETHERED TO A DIVER PROPULSION

vehicle, I darted through emerald-green Arctic waters at six kilometres per hour — banking to the left and then to the right — dodging ice formations off Labrador’s northern coast. It didn’t take me long to discover that snorkelling in pack ice is a contact sport ...

In July 2014, I led a 10-woman team from four countries on a 20-day “proof-of-concept” snorkel expedition from northern Labrador to western Greenland as part of the 2014-2016 Sedna Epic Expedition. In 2017, Team Sedna (named after Sedna, the Inuit goddess of the sea and the mother of all marine mammals) plans to mount a snorkel relay of the Northwest Passage — all 3,000 kilometres of it — to bring global attention to

disappearing sea ice and the impacts of ocean change in the Arctic. During our sea trials, we used the underwater scooters to show that snorkellers could successfully go the distance — up to 35 kilometres in 12 hours — in the 3,000-metre-deep open waters of Davis Strait and in coastal waters strewn with pack ice and bergy bits.

We celebrated a world first under the midnight sun as we snorkelled across the Arctic Circle, off the coast of western Greenland. During the 2014 expedition, Team Sedna focused on delivering ocean-related educational outreach, as it will during visits to the Arctic in 2016 and on 2017’s snorkel relay. In 2014, Team Sedna helped connect the Inuit community of Nain, Labrador, to the ocean. Using

footage from remotely operated vehicles equipped with cameras, as well as two large aquariums that allowed people to touch specimens we’d collected, we showcased local sea creatures in ways this community had never experienced.


The proof-of-concept expedition taught us many lessons, too. Key among them is that pack ice has a distinctly different profile below water than above it, something that can occasionally cause snorkellers to hit their heads on overhanging ice. Helmets will definitely be standard issue when we tackle the Northwest Passage in 2017.



Check out the video from the Sedna Epic Expedition team’s 2014 proof-of-concept mission at mag.cangeo.ca/apr14/sedna.

THIS
WATER
CAME FROM
MANURE ❄️



A man in a blue lab coat and safety glasses is pouring water from a black bottle into a clear container. The background is blurred, showing what appears to be a laboratory or industrial setting.

❖ Ross Thurston, the 2014 3M Environmental Innovation Award winner, is honoured for his system of turning farm waste into its reusable parts, including clean water

BY OMAR MOUALLEM
PHOTOGRAPHY BY PETER POWER

M

Maybe his grandfather's dairy resembled Ma and Pa Kettle's farm on the countryside, but third-generation farmer Gordon Speirs' Shiloh Dairy is an industrial operation. Nestled in Wisconsin, "America's Dairyland," the family company milks 2,100 cows three times daily. It's one of more than 20,000 concentrated animal feeding farms, or CAFOs, in North America. In other words, a factory farm. And one this size can produce as much manure as a city of 100,000 people.

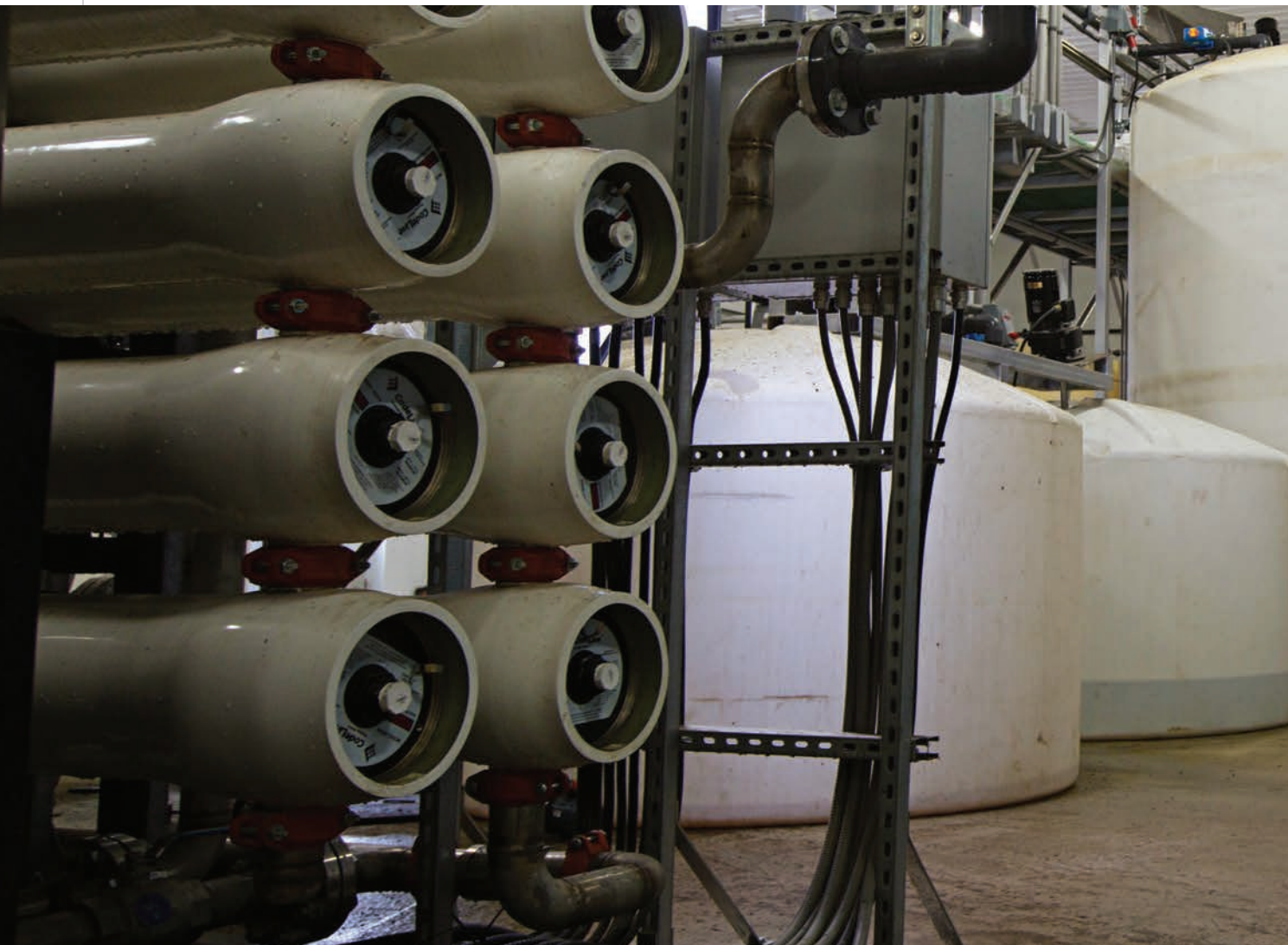
Liquefied with waste water, the effluent produced at Shiloh, like most such CAFOs, is hauled across the fields by trucks to a "lagoon," which in turn irrigates their alfalfa and corn crops with nutrient-rich fertilizer. It's an imperfect process. Not only can nutrients be over-applied, damaging and reducing yields, but some CAFOs close to water bodies risk runoff and contamination of water sources. Last summer, farm runoff spiked Lake Erie with so much phosphorus that the Great Lake was overcome with a swirling toxic algae bloom that cut off 500,000 Ohioans from their drinking supply for days.

But the Speirs have invested in a solution: Livestock Water Recycling (LWR), a patented system that treats the effluent,

turning it into useful solid nutrients and clean water, right on the farm. "Our industry needs to be moving in directions like this, doing a better job of conservation," says Speirs, "and this is the direction we chose." This will reduce Speirs' water withdrawal by 40 per cent, according to LWR inventor Ross Thurston, a city slicker with a 2014 3M Environmental Innovation Award in his Calgary office.

"My upbringing couldn't be further from a rural environment," says the 51-year-old born-and-raised Calgarian, sitting in a boardroom decorated with hog and cattle pop art. It's an average afternoon at the office, where 20 administrators, engineers and labourers work, but there's some buzz around the previous day's events: Bill Gates was photographed drinking treated human "poop-water," as one headline put it, to prove the efficacy of one of his investments in a sanitation system doing essentially what LWR has done since 2007.

A typical LWR system is 18.3 by 30.5 metres large. Its head is a funnel that can guzzle up to 360 million litres of hog or cow effluent annually; its tail end, a pipe spouting clear water. Between them, an intestinal track of pipes separates large phosphorus and organic nitrogen solids into a pile, which can be



applied to soil if the farmer has crops (or sold to one who does), and a nutrient liquid of mainly ammonium and potassium (also fertilizers) into a tank after a lot of conditioning, filtrating and dissolving. The fact that these fertilizers are segregated also means farmers can use them in exact measurements, rather than irrigating crops with mixed and disproportionately harmful amounts.

Back in the LWR headquarters, examples of these byproducts sit in enclosed glass bottles on the table before Thurston. Two contain hog manure and one holds water extracted from said manure, but now, apparently, so pristine you can drink it. And he does — taking a big swig of it at agriculture expos and on TV for incredulous onlookers. Visitors from Pakistan and China have also come to see the party trick. “Everywhere I went, from the suppliers to designers, they all said this can’t be done,” he says. “And now I can take you to a site where it’s working, and it’s working economically.”

In fact, he can take you to nine sites across the United States, namely the upper Midwest, where manure and dairy technology often set precedents for the rest of the developed world. It’s also where the Great Lakes provide a fifth of Earth’s surface fresh water.

Ross Thurston (BELOW LEFT) next to his Livestock Water Recycling system at Hudson Dairy in Hudson, Mich.

The machine, which extracts clean water from farm waste (PREVIOUS SPREAD AND BELOW) and uses a proprietary screen filtration system (BOTTOM), annually guzzles millions of litres of effluent produced by the dairy’s cows (MIDDLE).



“When we hear about water security,” explains Rob de Loë, University Research Chair in Water Policy and Governance at the University of Waterloo, “we think of places where water is scarce ... too many people pulling too much water out of the water source.” But, he explains, having an abundance of water that’s too toxic to drink is an insecurity too. “That’s exactly what happened in Lake Erie.” It’s also what happened in Walkerton, Ont., in 2000, when E. coli from farm run-off sickened nearly half the townspeople and killed seven. To test the purity of its byproducts, LWR recently commissioned a third-party objective study by Olds College, in Olds, Alta., that proved the water resulting from the system was pathogen-free.

“Dairies are fundamentally environmental,” says Thurston. “They recycle, they recover, they reuse. A lot of their feed is byproduct feed. They just haven’t had a tool to deal with their manure.” That’s exacerbated by the fact that the number of CAFOs has increased fourfold in the United States since the early 1980s and is set to balloon in Europe, where decades-old milk production quotas were recently lifted. “Ten years ago,” says Thurston, “a large dairy in Wisconsin was 400 cows. Today a large dairy in Wisconsin is 5,000 cows.”

Omar Mouallem is a National Magazine Award winner whose writing has appeared in Wired and The Walrus. Peter Power’s 25-year career as a photographer has seen him claim four National Newspaper Awards.



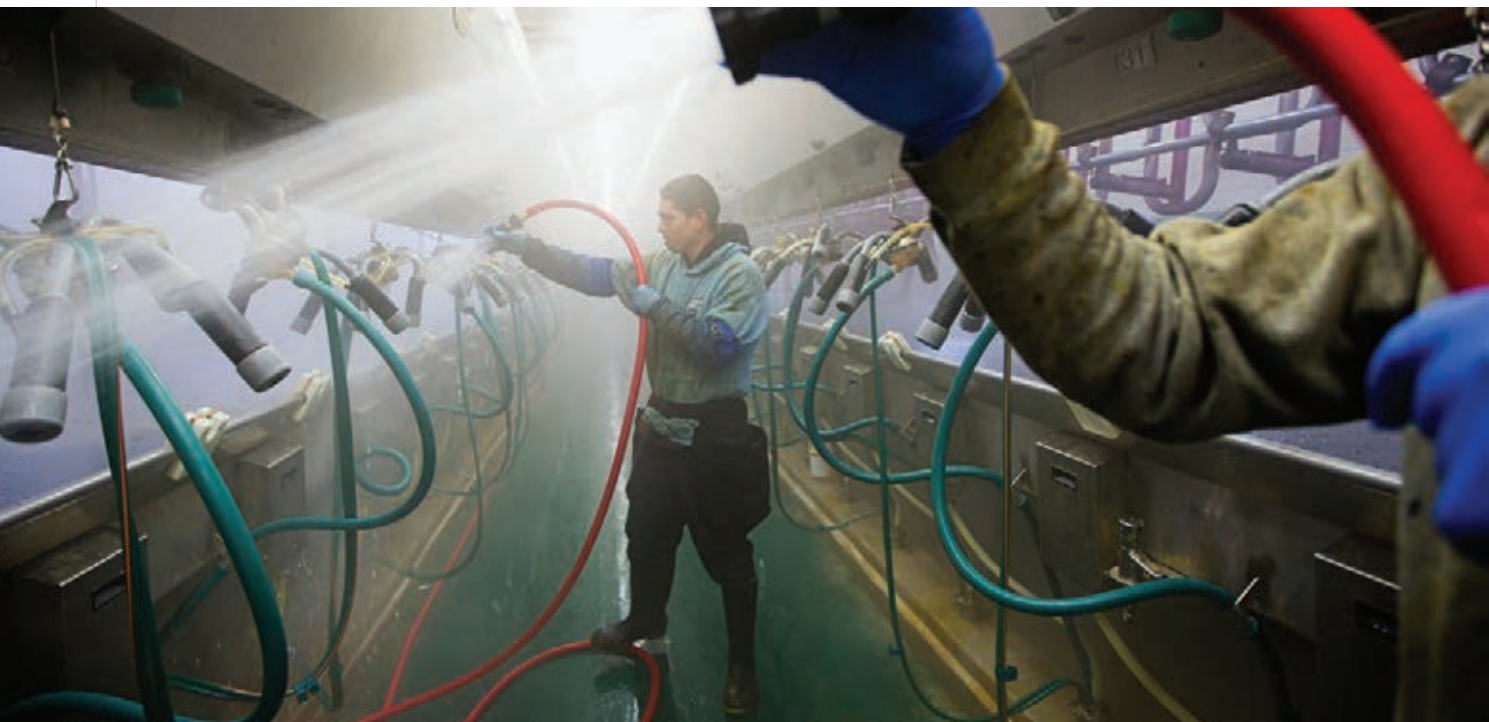
‘Dairies are fundamentally environmental. They recycle, they recover, they reuse. They just haven’t had a tool to deal with their manure.’

There are innumerable opponents of intensive animal farming practices, criticizing everything from air quality impact to the mistreatment of animals. But CAFOs wouldn’t exist if they weren’t profitable. Likewise, their owners’ motivations to adopt LWR — without mandate and at a cost of anywhere from \$500,000 to \$1.5 million — must also promise financial return. Thurston says it does, for farms with about

1,000 or more cattle or a few thousand hogs. “There’s potential to make a 20 to 30 per cent return on a \$1-million operation every year, in two to five years.”

Fertilizer is expensive, accounting for nearly a tenth of Canadian farmers’ expenses, according to Agriculture and Agri-Food Canada. LWR lets them store, manage and sell individual nutrient byproducts such as ammonium and phosphorus. Less waste also means less hauling. “Right now,” says Gordon Speirs of Shiloh Dairy, “it takes four trucks of manure to fertilize an acre of land. But once this system is running properly, it should only take between half or one truckload an acre.”

It’s heartening for de Loë, an expert on the Panel on Sustainable Management of Water in the Agricultural Landscapes of Canada, to learn that such farm-scale technology is now available. “Anything that’s affordable for the farmer — because otherwise it’s not going to be used — that can effectively remove pathogens and nutrients from livestock run-off is fabulous. Bring it on!”





Clockwise from ABOVE: a technician watches a pressure gauge during the Livestock Water Recycling system's final stage; clean-up in the Hudson Dairy's milking parlour; Ross Thurston with clean water produced by his invention.

Thurston hesitates to call himself an environmentalist. And though he's an entrepreneur through and through (LWR expects to double its revenues this year), he is, above all, a chemist who geeks out on the aesthetic pleasure of turning dirty water clean. "He usually has a mad-scientist look to him," adds LWR marketing coordinator Lisa Fast during a tour of the production garage, where most of the system is assembled in three parts, loaded onto 18-wheelers and sent across the continent.

After Thurston graduated from Queen's University in Kingston, Ont., with a chemistry degree in 1986, his father, an oil and gas executive, got him a job at a Northern Alberta hazardous waste plant. But while the sludge — potent with heavy metals, salts, crude oil — was separated for safer and easier disposal, Thurston fixated on the clean water coming out the other end. "I quit my job when I thought, I'll go do that instead."

He created the company Industrial Waste Recycling in 1989, which was perfectly timed with a change in regulations that created a market for treating hydro-carbonated ground water. "It was pretty niche," he says. "We came up with something that we took all over North America." By 2001, IWR had been commissioned by multinationals as far away as Brazil and counted JFK Airport as a client.

But by then, most contaminated groundwater sites had been cleaned, he says, and IWR became a victim of its own success. Business declined. Further, because so often their services were government-mandated, clients didn't value their product, says Thurston. "We weren't making them something that improved their bottom line. So we started looking for what else we could do with water, and that offered maximum value for our customer."

The shrinking IWR team plunged into environmental research and, to their surprise, learned that agriculture accounts for 70 per cent of the world's water consumption, according to the UN World Water Development Report. Paradoxically, the planet needs to produce enough food for nine billion people by 2050 — with fewer natural resources. The IWR team wondered where they fit into this scenario. "Our

specialty was taking really dirty, crappy water and cleaning it up," deadpans Thurston. "We pulled the curtain back on 'ag' and discovered manure."

But, of course, manure and hydrocarbon waste are vastly different. "I went from being an expert in what I did to being an urban neophyte who knew nothing. We went to shows, went to conferences. Farmers love to talk to you about their stuff. We spent a lot of time reading and listening until we really understood manure."

'Our specialty was taking really dirty, crappy water and cleaning it up. We pulled back the curtain on 'ag' and discovered manure.'

Since the first working LWR was installed on a Manitoba pig farm in 2008, Thurston and his growing engineering team have tweaked and improved the technology. Farmers can now operate it remotely, with an iPad app, and LWR is currently building a system


capable of treating blended hog and cow manure. But for the global agricultural industry, its most promising feature has already been proven: it's farm-scale technology that can shrink, grow and adapt for individual producers. "All farm systems have different approaches to how they deal with water," explains Robert Gordon, an environmental scientist specializing in agriculture at the University of Guelph. "New technology like this is going to create further opportunities for reducing the environmental footprint of our food production systems."

Thurston, for his part, seems to be warming up to the environmentalist label. "My other businesses didn't feel like we were doing as much potential good as we are now," he says. "I know we've now changed the way this issue will be dealt with. Whether we're successful at it, or somebody copies us, or somebody buys us or we blow up, we've opened their eyes. The whole world said this can't be done."



Read an interview with Peter Power about his experiences and insights while photographing water usage at Hudson Dairy, a concentrated animal feeding farm in Hudson, Mich., at mag.cangeo.ca/apr15/3M.





The way of bear F148

Satellite tracking of grizzlies in Alberta's Banff National Park is teaching us great lessons about the bears' habits and habitats. And how to live with them.

BY LESLIE ANTHONY



In the early hours of July 11, 2014, a month after being fitted with a GPS collar that recorded her position every two hours, a young female grizzly bear, tagged F148, lay down on the outskirts of Alberta's Banff townsite for a few hours rest. Earlier she'd spent time foraging grasses and protein-rich forbs near horse corrals at the town's main entrance from the Trans-Canada Highway. Observed here often by park staff and the public, she was tolerant enough of the human presence to be permitted these gustatory pursuits. And now, according to her collar, she was sleeping even closer to human facilities — not for the first or last time in a pattern that those tracking her had come to understand in a novel context: as a security measure.

The penchant for bedding down near buildings, roadways and other infrastructure is one of the more recent pieces in the puzzle of grizzly biology and behaviour revealed through some 30 years of

tagging studies in Alberta's Bow River corridor. It's also emblematic of the double-edged sword of coexistence with grizzlies: just as bears are part of life for the people of Banff, humans are part of life for F148, who has never known different. With bears as adept as humans at identifying and exploiting opportunities and benefits in our shared environment, where is the line between codependence and conservation?

It's a question that Steve Michel, human-wildlife conflict specialist at Parks Canada in Banff, is intimately familiar with. With campgrounds, trails, golf courses, railroads, highways and even backyard fruit trees under his aegis, Michel is charged with deciding when a bear can legitimately remain where it is and when it might need persuasion — or genuine aversion — to move along. The information and lessons required to make such decisions don't all come as easily as the data being beamed to headquarters from F148.

Bear F148 feasts on some early-summer dandelions near the town of Banff. This image is a screen grab of a video taken with a remote wildlife camera.

In a 2013 TEDx talk in nearby Canmore on “Living with Wildlife,” Michel confesses to an affair with a good-looking female in her mid 20s, joking that although he doesn’t know her name, he can always “track her down — because I’ve got her number.” In typical small-town fashion, the audience was already aware of this dalliance, laughing at the obvious reference to Banff’s most famous grizzly, F64 — F148’s mother.

Years before, on a popular trail, Michel had encountered mom in “a worst-case scenario” — surprising her as she fed on an elk carcass with her cubs, furthering the provocation by making eye contact at close range. But after a few frozen seconds, the bear simply looked back down and continued eating. Heart in throat, Michel backed away.

In his talk, he shares the conclusion he reached after reflecting on such experiences and the wealth of data from ongoing studies in places such as Banff and Lake Louise: “One of [our] big insights... is that grizzly bears often like to come close to us; they do that on purpose and they do it for their own safety.... And you might be thinking, ‘Well, what does a

grizzly bear have to fear?’... the reality is they have to fear other, bigger grizzly bears; so for young [grizzlies] or particularly females with cubs, if they come close to human facilities... they can keep their cubs safe.... We can all relate to this idea: Who wouldn’t want to keep your kids safe? And I think if we understand why they’re doing that, we can go a long way to putting fear aside and replacing it with respect.”

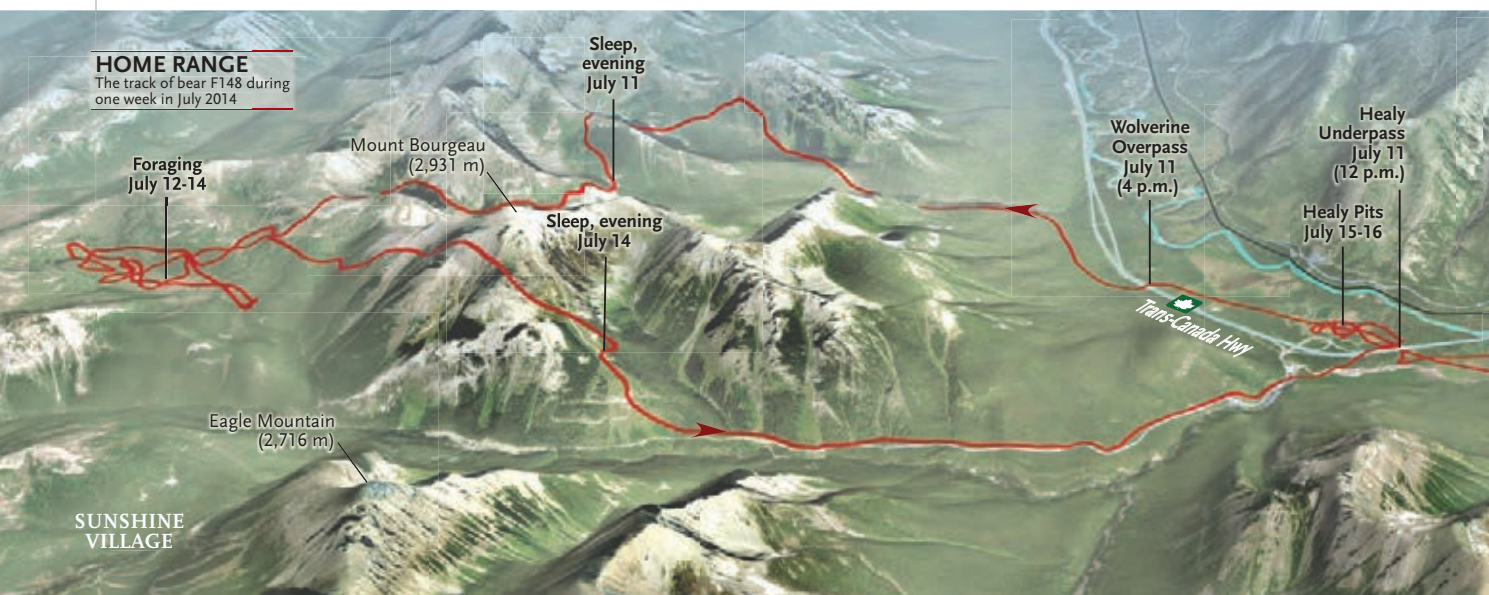
It’s only been 40 years since we realized bears use the landscape at a greater scale than previously thought.

Respect is something old F64 would earn from staff and visitors alike; perhaps because, unlike many bears, she’d dodged a highway or railway death to carve out a difficult living on an increasingly busy landscape. Despite the harassments of overeager wildlife photographers or naïve tourists tossing sandwich meat from a van, she’d exhibited both restraint and

tolerance of the humans with whom she shared the land.

First tagged during a research project in 1999, F64 would later produce two known litters. In 2006, she emerged from hibernation with three female cubs, turning the two that survived out on their own in 2009. (In a sadly typical story, both were killed, one on the rail line in 2010, the other a year later on the Trans-Canada Highway.) Freed of the travails of motherhood, F64 spent summer 2010 in the company of several male grizzlies. Not surprisingly, spring 2011 found her with three more gambolling furballs in tow — a critical mass of camera-ready cute symbolizing the very wilderness evoking, charismatic megafauna people flock to Banff to see.

After years as a virtual attraction, however, F64 disappeared in October 2013, age 24. Though her trio of offspring — including yet-to-be-tagged F148 — lingered around town, there was no sign of the famous matriarch. Nor would there be in 2014. Tongues wagged: where was she? Although possible she’d had new cubs and was hunkered down in a remote



Bear F64 (tagged as 114 after her original tag was damaged) in 2011 with two of the three cubs she had that year (RIGHT), one of which was bear F148.

area to avoid male bears, her age — at the upper end for wild grizzlies — suggested she'd more likely died of natural causes, or had been killed by another bear while defending her cubs.

F64's legacy included increased public awareness of the challenges facing Banff's bears, plus an unprecedented contribution to the knowledge of how a female with cubs uses both natural and human-made elements of the landscape throughout the year. A more important legacy, perhaps, was the lifetime's worth of knowledge F64 passed to her scions. When her cub F148 was tagged in June, 2014 (see "Collared" on page 52), the information she began generating not only provided insight into the life of a young female grizzly, but it could be paired with that of her mother for a multigenerational picture.

Leaving the townsite at first light on July 11, F148 crossed the CP rail line and headed west along Sundance Canyon/Healy Creek trails, high-human-use thoroughfares that also link bear foraging opportunities. With a habit of travelling within 100 metres of the public, she was often spotted in this corridor. Crossing the Trans-Canada at Healy Underpass, she entered Healy Pits, a reclaimed gravel



excavation that offers both decent feeding and good sightlines from which to monitor the approach of males. It was an area F148 knew well: she'd spent much time here with her mother.

A 2013 University of Alberta study highlighting the major role mother grizzlies play in teaching cubs about habitat was clearly reflected in F148's movements, and even captured in remote camera images of her crossing a wildlife overpass as a young cub in the company of her mother, and more recently on her own.

In the afternoon, F148 crossed the highway for a second time at Wolverine Overpass, and by 5 p.m. was ascending into the alpine. After travelling 18.2 kilometres, she would eventually stop for the

night. Resuming her wanderings on the 12th, she climbed 2,473-metre Harvey Pass and spent the next two days in a remote alpine basin to the northwest of the Sunshine Village Ski Area. Here she could grub up glacier lily and spring beauty bulbs, or the roots of alpine sweet-vetch, a flowering legume with a circum-polar distribution endorsed by bruins the world over. She may also have tried digging up ground squirrels. Once again, it may have been an environment familiar from childhood. "It's typical for sows with young-of-year cubs to hunker down in high-elevation bowls and get out of the main traffic areas during breeding season," says Mike Gibeau, a conservation coordinator with the Nature Conservancy of Canada and former

JOHN E. MARRIOTT/WILDERNESSPRINTS.COM





Bear F64 was famous in Banff, where she was often seen with her cubs (ABOVE and RIGHT) or on her own (TOP RIGHT).



carnivore specialist with Parks Canada. "Especially with big males around."

On the other hand, once snow has retreated, most grizzly home ranges include varied habitat that extends from valley bottom to alpine. "Her movements were pretty representative," notes Michel of F148, "though she has the smallest range of all the bears we monitored. Home ranges for males are three to four times as large."

The great distances covered by some males has been another revelation delivered by radio-collar studies. "It's only been 40 years since we realized bears use the landscape at a greater scale than previously thought, and that a healthy, sustainable population requires hundreds of individuals interacting over tens of thousands of square kilometres," says Wendy Francis, program director at Yellowstone to Yukon, a conservation group that seeks to restore landscape connectivity for wildlife in that vast region. "Territories like that require both large park protected areas and management of the

remaining landscape," Francis continues. "Facilitating genetic diversity is the ultimate goal — genetic resilience is key in adapting to things like climate change."

Radio-collar data are particularly useful for garnering buy-in for such wide-ranging conservation efforts. "You can show ranchers in southwest Alberta — where the number of grizzlies on the prairie is actually increasing — that the bear on their land was captured 150 kilometres away in Banff a month earlier," says Gibeau. "Conversely, you're able to tell them that the five bears they saw one week were actually the same bear. Radio collaring is like a fingerprint — it puts a particular individual at a particular place at a particular time."

Gibeau should know, having logged some 1,000 hours in a single year in a small plane, tracking bears by VHF antennae. "GPS technology has revolutionized everything. Now a satellite system tracks the bear and you sit in front of a computer and wait for the data to roll in. It also makes the data much less

biased: we couldn't track by night, and only found bears where we looked; if they were hiding somewhere we didn't fly, we were out of luck."

Gibeau's many studies delivered information on everything from grizzly reproductive rate (three to four times over a lifetime) to lifespan (20 to 25 years) and the predilections of various ages and sex with respect to transportation infrastructure (e.g., being closer to roads regardless of time of day predisposed young adults to greater encounter rates with humans, and thus a greater chance of being killed). To prevent loss of habitat connectivity, a number of mitigations were recommended, including maintaining high-quality habitat next to roads, installing continuous highway fencing and creating wildlife passages.

Leslie Anthony (@docleslie) is an avid adventurer who also holds a PhD in zoology. His writing also appears in Skier, Explore and Powder magazines.



Bear F64 and her three cubs (ABOVE) stand next to a wildlife fence west of Banff and near the Trans-Canada Highway in 2011.

Beginning in 1981, the 83 kilometres of Trans-Canada Highway passing through Banff were upgraded to a four-lane divided highway from two, with fencing subsequently added to help reduce collisions between vehicles and wildlife. In 1996, during a 30-kilometre upgrade from Banff to Castle Junction, Parks began building wildlife crossings; today these total 38 underpasses and six overpasses. Although this reduced wildlife collisions by some 80 per cent, grizzlies took about five years to get used to them, and it remained unclear whether they used crossings to find mates. A 2014 genetic analysis by Montana State University researchers, however, showed bears are indeed crossing the highway to seek mates, restoring the gene flow seen as critical to conserving the species.

By the evening of July 14th, F148 was again on the move, descending from her alpine sanctuary; she would make it only as far as an adjacent bowl before bedding down. On the 15th, using terrain next to Sunshine's access road, she resumed her journey to the valley, crossing the highway back into the familiar area of Healy Pits and sleeping that night in nearby forest. About 5 p.m. on July 16th she reversed course through the Healy Underpass only to then re-cross both highway and CP

cause of mortality, and that Five Mile Bridge, where F148 often crossed, has proven exceptionally deadly since numbers began spiking in 1999. Speculation over the cause zeroed in on grain spilled along the tracks from the up to 30 trains that pass each day. Though CP spent heavily on educating grain handlers and refitting rail cars to cut down on spillage, the deaths continued. With Alberta's some 700 remaining grizzlies officially declared threatened, and only 60 to 70 resident or transient in Banff National Park, immediate action to ensure their survival was critical.

In 2010, CP and Parks Canada signed a five-year joint plan aimed at reducing grizzly mortality. A \$1 million grant from CP now supports research into everything from geology and

geography to vegetation, prescribed fire and land-clearing, electric fencing, grain aversion and aspects of basic biology and behaviour that might make bears more vulnerable to rail strikes.

While tracking has proven integral to such studies, not everyone in the corridor is supportive. The animal-rights/welfare

'Radio collaring is like a fingerprint — it puts a particular bear at a particular place at a particular time.'

line at Five Mile Underpass, ending up on the 1A secondary road. Steadily moving east, she would cross the highway one last time before spending the night near the Banff Legacy Trail.

No conversation about grizzlies in Banff can avoid the fact that trains have surpassed vehicles as the bears' primary

COLLARED

How Parks Canada captures and tracks grizzly bears



On June 11, 2014, Steve Michel and two co-workers hauled a culvert-style trap baited with a skinned beaver onto the Banff Springs golf course. The young female grizzly they hoped to lure into it, however, remained anywhere from skittish to indifferent, preferring to roll around in grass clippings and graze the fairways like she owned the place.

“From a bear’s perspective a golf course is enhanced habitat,” says Michel, human-wildlife conflict specialist at Parks Canada in Banff. “We open up these vast areas, then fertilize and aggressively water them so they’re as lush as roadsides. After 100 years of fire suppression, they’re one of the few open disturbances on the landscape, valuable to bears in spring when everything else is snowbound.”

Both crew and quarry would have an eventful day: amid a golf tournament, the 61-kilogram bear would be variously chased by a deer and an off-leash dog (the latter’s owner charged for allowing it to run free in a national park) and have gawkers photograph her. When she failed to enter the trap by nightfall, Michel’s team instead guided her to the safety of a nearby wildlife corridor.

They nevertheless got their bear the next day, tranquilizing her with a dart. While anesthetized (pictured ABOVE), the 3½-year-old bruin was equipped with a GPS collar and an ear tag bearing the number she was assigned — F148. Hair, blood and tissue samples were taken for various analyses. After 90 minutes, the anesthetic was chemically reversed; the bear recovered in the trap before being released into the environment.

GPS collars store satellite fixes (locations) of an animal’s position. After 12 successful fixes, the data are sent via satellite or cell network to the manufacturer’s server from where they’re relayed back to researchers. A two-way communication function allows for remote programming changes to signal strength or periodicity. For instance, the default fix rate of every two hours (as for F148) can be altered to 20 minutes for bears spending more time around the rail line, generating more fine-scaled spatial data to better understand these interactions. Conversely, “back-country” bears that rarely spend time near humans might have their rate set to four hours to preserve battery life.

According to Dave Garrow, a Parks Canada wildlife specialist, the “biggest consideration is balancing the number of fixes with the limited battery power. The more fixes, the shorter the battery life and the more bears you have to catch for the same amount of data.”

For safety, managers also have the ability to remove collars remotely: an ultra-high-frequency signal activates a pneumatic charge that allows the collar to drop off. Collars are also affixed with a piece of cotton that will rot in three to four years, so that even if the electronics fail and they can’t catch the bear, it won’t be saddled for life.

camp is a vocal pocket of anti-collaring sentiment, regardless of what information might be gleaned. Because everyone from Gibeau to Michel acknowledges that collaring is costly, traumatic and dangerous for bears and wildlife managers alike, looking for other monitoring methods is very much part of the Parks-CP joint effort. In a 2014 analysis of hair samples, differing signatures of nitrogen and sulfur isotopes allowed researchers to distinguish bears that foraged along the railway from those that didn’t, suggesting a non-invasive, affordable and efficient technique to identify rail-associated bears. Regardless of their broad utility in segmenting a population, however, such studies don’t deliver the temporal or spatial details of collars, which in turn can’t provide the momentary resolution of cameras. “Pooling all data sources gives you a much more detailed picture of the mechanisms driving bear movements,” says Colleen Cassady St. Clair, the study lead and a professor at the University of Alberta. “It’s both more comprehensive and more accurate, with one data set informing how you interpret the information from another — a classic case of the whole being greater than the sum of its parts.”

On July 17th, F148 continued back toward town along the Vermilion Lakes Road, where the picturesque nature and abundant wildlife make it popular with tourists, and buffalo berries made it a route her mother also frequented. Skirting the perimeter of the townsite, she crossed the Trans-Canada at Buffalo Underpass, remaining on the side of the highway below Cascade Mountain and sleeping near Cascade Ponds, a popular swimming and picnicking site directly north of the horse paddocks where she began her circuit a week before. In that time, she’d travelled a total of 60.8 kilometres, about seven per cent of the 831.8 kilometres she would cover from the day she was collared to November 6, when tracking halted for the winter. F148’s movements

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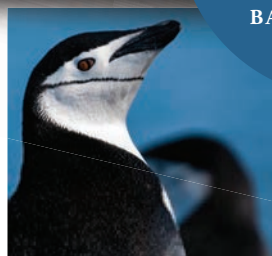
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A grizzly cub (ABOVE, left) looking for some reassurance nuzzles its mother near Mount Robson Provincial Park, B.C.

very much echoed those of her mother, F64: of 1,750 GPS fixes, 661 were within two kilometres of the townsite, making for some 38 per cent of her time spent near people. It's the very kind of data needed to fit Banff's bears into the bigger picture of human-bear conflict in the corridor being looked at by everyone, regardless of jurisdiction.

"The uniqueness of Banff and the immediate Bow Valley area is that folks move there to coexist with nature — elk, moose, bears — and they're keen to adopt mitigation measures so the species can persist. From [tracking] work we know more about seasonal movement patterns and food searches, etc.," says Courtney Hughes, a doctoral candidate in social sciences at the University of Alberta studying social tolerance for

grizzlies. "Such positive attitudes toward grizzlies can be used as a case study, but on the cusp of that region — to the north and south — it's a different attitude and value system; people living outside protected areas may 'like' grizzlies, but they have to deal with the problems bears might create in their lives."

When it comes to mitigating human-bear conflict, Gibeau points to great work being done by ranchers with the Waterton Biosphere Reserve's Carnivore Working Group in southwestern Alberta, and Wendy Francis allows that although it's still a work in progress, efforts in the Bow Valley remain a leading example in the grand Yellowstone to Yukon picture. "Canmore residents created designated wildlife corridors so animals can continue to move through the town; there's a garbage management regime; the WildSmart program teaches people everything from the kinds of plants they should have on their property to how to

use bear spray to how to travel with dogs to reducing attractants. It's a good example of a community in a critical wildlife corridor trying to do the right thing," she says.

Ultimately, the utility of advances in technology are less about individual disposition of bears than their bigger ecological role. "Grizzlies are an indicator species that tell you how healthy an ecosystem is. If grizzlies aren't doing well, then the environment is likely compromised, and there's a good chance it will eventually impact people," says Michel. "But grizzly bears are also one of the most difficult species for us to get along with, and that's why I think if we can learn to get along with them, we can learn to get along with any wildlife species."



Read more about how rail traffic affects the grizzly bears of Banff National Park at mag.cangeo.ca/apr15/bear.

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The background is a red-tinted illustration of a city street scene. It features several cars parked and driving, a building with a 'HOT & FAST' sign, and a 'E-THRU OPEN' sign with an arrow. The scene is viewed from an elevated perspective.

The geography of **Obesity**

FOR CANADIAN RESEARCHERS INVESTIGATING
HOW THE DESIGN OF CITIES AND SUBURBS
AFFECTS OUR HEALTH, GOD IS IN THE DETAILS

BY PAUL WEBSTER
ILLUSTRATIONS BY GUY PARSONS

ON A RECENT TOUR AROUND LONDON, ONT., Jason Gilliland zipped down the car window and jabbed a finger at a thicket of fast-food outlets and apartment towers facing a suburban highway. By profession, Gilliland teaches urban geography at Western University, where he runs the Human Environments Analysis Laboratory. By persuasion, however, he's a food fanatic whose career has been devoted to probing how city planning affects diet and health. "What you're looking at there," he fumed, "is a highly obesogenic cityscape. Junk food, highways, apartment buildings and parking lots. And pretty much zero opportunity for the people to take a walk or ride a bike."

The term "obesogenic," Gilliland explained, refers to a wide array of conditions that promote obesity, including inadequate physical activity and poor diet. It was coined by researchers probing why obesity has roughly doubled in prevalence in many countries, including Canada, since 1981. With about one in four adults and almost 10 per cent of youth obese, according to a 2011 federal government report, researchers from numerous disciplines including geography are flocking to the topic, with work on the linkages between food availability, neighbourhood environments and residents' physical health conditions also underway in Vancouver, Edmonton, Saskatoon, Waterloo, Toronto and Montreal.

Rounding a corner, Gilliland pointed at a billboard advertising units for sale in a newly completed retirement complex. "Why Walk?" the billboard read. "That says it all," Gilliland exclaimed. "Shouldn't it say why not walk?"

proximity of unhealthy food establishments on adolescents' eating behaviours," Gilliland's study concluded, "environmental strategies are vital to help combat the increasing obesity epidemic."

These days, identifying those strategies — the factors in urban planning that can help slow and reverse the rising rates of obesity — is Gilliland's biggest preoccupation. To do it, he's turned the entire city of London — with its walkable historical core surrounded by concentric rings of largely unwalkable modern suburbs — into a laboratory. Acting as a consultant to the city's government, he recently helped revise its future development master plan to include 94 references to healthy food availability. "Food wasn't mentioned in the previous plan," says Gilliland, who emphasizes the need to inform transportation planning with health considerations.

Meanwhile, at his lab on campus at Western University, Gilliland heads a four-year study of 851 school children from 46 schools in urban, suburban, rural and small-town neighbourhoods. The aim, he explains, is to nail down a massive lode of information about the kids' physical activities, their food consumption, their body weights and the geography they inhabit. By studying the dietary behaviours and physical activity levels of kids from inner-city neighbourhoods, suburbs and outlying villages who either walk or are driven or bused to school, Gilliland intends to gain a comprehensive matrix of health-related information. "Our hope," he explains, "is to better understand how urban and suburban environments drive obesity."

**Jason Gilliland
has turned the entire
city of London — with its
walkable historical core
surrounded by concentric rings
of largely unwalkable
modern suburbs — into
a laboratory.**



It's not an idle question. According to a study of adolescent eating patterns Gilliland published in 2012, some of London's suburban neighbourhoods, with their heavy bias toward automobile dependency, their dearth of sidewalks and bike paths and their multitude of low-quality food outlets, are highly obesogenic. "Given the negative impact of the close



Gilliland's research into the causes of obesity is powered by reams of data from multiple sources. One key dataset emanates from a geographical information system (GIS) laboriously compiled by his team for the entire city of London. The system tracks about 500 variables, ranging from climate conditions to green space, roadways and food sources.



Alongside this is data from electronic movement-tracking devices known as accelerometers — designed to record physical activities as well as trips to restaurants and other food outlets — and GPS units, both worn by each of the children enrolled in the study. “We think we’ll wind up with something like a billion data points per child,” Gilliland enthuses. By cross-referencing data on the children’s physical conditions (which is collected periodically throughout the study) with data on their movements, as well as the GIS data on the locations of retail food sources, Gilliland expects to achieve powerful new insights. “You have to use mixed methods to understand the causes of obesity,” he explains. “That’s why there’s a real need for geographers in obesity research. The geography of health has become a hot topic.”

Rachel Engler-Stringer, a nutritionist in the department of community health and epidemiology at the University of Saskatchewan, shares Gilliland’s conviction that geographers can play vital roles in probing obesity. Some of her research currently focuses on the Good Food Junction, a food co-op in Saskatoon’s gritty west end. At first glance, the store seems like any other ordinary no-nonsense urban supermarket. But many people living nearby consider it to be something of a miracle. Long abandoned by major supermarket chains, the area around the store is described by nutritionists as a “food desert”: according to a 2013 study published by the Saskatoon Health Region’s Public Health Observatory, Saskatoon’s most deprived neighbourhoods have significantly fewer supermarkets than its wealthy neighbourhoods do.

Paul Webster (paulcwebster.com) is a Toronto-based writer interested in the convergence of themes in science, business and politics in Canada and abroad. His writing has garnered four National Magazine Awards.

To overcome their lack of access to healthy food, community members formed a co-op, built the store and opened it for business in October 2012.

Now Engler-Stringer is probing whether the store is yielding health benefits to residents in the area, as part of a larger investigation into the relationship between children’s health, neighbourhood geography and food availability in Saskatoon.

Using data from a city-wide dietary survey conducted within a set of studies mapping the location and type of every retail food outlet in the city and characterizing the food environments in which Saskatoon families live, over the course of the next two years Engler-Stringer will closely monitor the health of local children, including their body weight, to probe whether neighbourhoods that lack supermarket access have heightened obesity levels. Like Gilliland in London, Engler-Stringer says Saskatoon, with its contained geography of 70 distinct neighbourhoods and its population of 246,000, “offers ideal conditions for research to understand the factors that drive obesity.”



Innovative approaches such as Gilliland’s and Engler-Stringer’s are urgently needed, argues Mark Tremblay, director of healthy active living and obesity research at the Children’s Hospital of Eastern Ontario Research Institute in Ottawa. Better analyses of the links between physical inactivity — or sedentary behaviour, as Tremblay calls it — and obesity are in high demand, he explains. The widespread escalation in body mass, Tremblay argues, can be understood only by closely studying the ways that Canadians eat, sleep and move around the places they live. “The minutiae of our daily activities has changed in ways that promote obesity,” he argues. “We need to know much more about the lifestyle factors propelling this epidemic.”

‘Food swamps,’ neighbourhoods where high-fat, high-calorie foods are plentiful and healthier foods are rare, are a common problem.



Leia Minaker, a public health scientist with the Propel Centre for Population Health Impact at the University of Waterloo who recently completed a national survey of research into the geography of food availability in Canada, says that of 15 recently published Canadian studies of food access in relation to diet-related health outcomes, 12 concluded that the food environment plays a significant role in health. “In the past, the idea was that with enough knowledge about healthy eating, individuals would choose nutritious diets to prevent future illnesses,” Minaker explains. “But as we’ve come to factor the food environment into the picture, it’s becoming clearer that geographical factors like urban landscapes also matter in determining what people eat and how much exercise they get.”

Not all cities are the same, Minaker cautions. While some, such as Saskatoon, appear to have significant food deserts, the most common problem in Canadian cities may not be with food deserts, she argues, but rather “food swamps” — neighbourhoods such as the London suburbs where sources of high-fat, high-calorie foods are plentiful and sources of healthier foods are rare. Among people living in such areas — especially those without easy access to automobile transportation — the poor quality of the most easily available food could obviously heighten the risk of obesity.

But not everyone agrees that the location of food sources is pre-eminently important when it comes to persuading

people to buy healthy food. According to a 2014 study by researchers with the Virginia-based Rand Corporation about the relationship between obesity and decision-making by food shoppers in Pittsburgh, Pa., the price of food may play a more crucial role in influencing diet. “Although distance and store prices were independently associated with obesity,” the study found, “only price remained significant when both variables were included.” One problem, the study found, is that low-price supermarkets tend to display and promote junk food more prominently than high-price supermarkets do. “Although low- and high-price stores did not differ in availability, they significantly differed in their display and marketing of junk foods relative to healthy foods.” The study concluded that these differences in how food is marketed may explain why shoppers at high-price food stores were less likely to be obese.

In London, Jason Gilliland acknowledges that the verdict is still out on the links between obesity and neighbourhood planning. “I’d be strung up alive if I pointed to a specific neighbourhood as being especially obesogenic,” he admits. “But I certainly point to a certain type of neighbourhood and call it that. I’m talking about neighbourhoods designed around cars and not pedestrians. And, unfortunately, just about every neighbourhood that’s been built in this country in the past half century matches this description.”



CANADIAN GEOGRAPHIC EDUCATION

Find a lesson plan relating to this feature and the associated map on page 30 at cgeducation.ca/resources/in_the_classroom, where there are more learning resources for other stories from past issues.



See some of the maps that Jason Gilliland and his team at the Human Environments Analysis Laboratory have created during their research into obesity at mag.cangeo.ca/apr15/obesity.



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The **National Bird Project**

This essay is the latest in a series in support of specific species for *Canadian Geographic's* National Bird Project — a campaign to have Canada recognize an official national avian emblem. Vote and submit your own essay at nationalbird.cangeo.ca.



Brown-headed cowbird

Admirably adaptable strategist

By Jay Ingram

I NOMINATE the brown-headed cowbird as Canada's national bird. Yes, even though the cowbird is almost universally reviled, I nominate it as a reminder of the invisible human hand in the environment.

I admit it's not easy to watch a tiny fly-catcher desperately feeding the giant cowbird chick that she has faithfully raised, while losing most of her offspring at the same time. She didn't volunteer for the task; she was outmanoeuvred. But you have to admit it is a brilliant evolutionary strategy. Why waste time and energy solidifying your genetic future when someone else will do it for you? This practice, called nest parasitism, has evolved in many species around the world, but the cowbird is the Canadian representative.

Well, OK, it's in the U.S. too, but when it comes to nature, borders are irrelevant (think whooping cranes). So, why argue that cowbirds should become a permanent reminder of human interference in the environment?

Cowbirds are admirably adaptable: they established themselves in North America by following the vast bison herds (or even the large mammals of the Pleistocene before that), eating the insects flushed out of the soil by the ungulates' hoofs or attracted by their droppings, and for centuries the birds' range was delimited by those animals. When Europeans did their best to extinguish the bison, was it lights out for the cowbird? No, they simply switched to following cattle.

But they got their big break when we humans began to clear the forests for

farmland. That clearing exposed many forest-dwelling birds to cowbirds for the first time, especially along the forest edge. Not only does that mean that the most vulnerable species simply haven't had time to adapt to the existence of a bird that will hijack their parenting, it also points the finger of blame squarely at us.

So the revulsion we feel when we see cowbirds victimize some of our most beautiful songbirds is real. At the same time, we have to admit that we are as responsible as they are.

Science writer and broadcaster Jay Ingram (@jayingram) was the co-host of Discovery Channel's Daily Planet show for 16 years. His most recent book is The End of Memory: A Natural History of Aging and Alzheimer's.



photo^{finish}

For nearly three decades, the *Canadian Geographic* Annual Photo Contest has attracted some of the country's best photographers. This year, more than 6,000 entries were submitted, with subjects ranging from the ever-photogenic grizzly to community festivals. The judges — *Canadian Geographic*'s new media manager Paul Politis, graphic designer Jenny Chew and southern Ontario-based photographer Mark Raycroft — combed through the pictures to select the winning images shown here.

CANADIAN GEOGRAPHIC
PRESENTS THE WINNERS
OF ITS 29TH ANNUAL
PHOTO CONTEST



CANADIAN LANDSCAPES
WINNER

Lake Louise magic

Eden Watt

A young boy stops to admire the view in Lake Louise, Alta., waving a wand he's just received from the Fairmont Chateau Lake Louise hotel.



CANADIAN LANDSCAPES

RUNNER-UP

Waves of shadows in the snow

Christine Fitzgerald

Tree shadows fall in waves across an undulating canvas of fresh snow on a sunny afternoon in Mont Tremblant, Que.



See all the winning images from the 29th Annual Photo Contest, including honourable mentions, at annual14.canadiangeographic.ca.



OUTDOOR ACTIVITIES

WINNER

Hiking in the morning

Akiko Sugita

Shortly after dawn, sunlight streams onto a trail in Golden Ears Provincial Park, B.C.

OUTDOOR ACTIVITIES

RUNNER-UP

Ghost aurora borealis

Greg Harvey

A man stands behind a tent in Wapusk National Park, Man. He stepped away mid-exposure to achieve this ghost-like appearance.



FLORA AND FAUNA

RUNNER-UP

Kestrel

Theodore Lo

A chattering and colourful kestrel perches atop a stump in the woods near Simcoe, Ont.



FLORA AND FAUNA

WINNER

Portrait of a fly

Rommel Billanes

Studio lighting brings out the incredible detail on this fly, which was found on a window in Victoria.

FESTIVALS AND CELEBRATIONS

WINNER

Colour moment

Lu Zhang

Runners dance under a shower of coloured powder at the Colour Run in Kanata, Ont.



FESTIVALS AND CELEBRATIONS

RUNNER-UP

Canada Day

Lu Zhang

On Canada Day, Ottawa's Parliament Hill is host to the biggest fireworks display in the country.



FAVOURITE PLACES

WINNER

Moraine in blue

Nunzio Guerrera

The mountains in Banff National Park, Alta., are illuminated in a pre-dawn glow.

FAVOURITE PLACES

RUNNER-UP

Peggys Cove harbour

Magda Bognar

A 30-second exposure was used to capture the remaining light after sunset at Peggys Cove, N.S.



A word about our prize sponsors

It took more than the talents of our readers to make the 29th *Canadian Geographic* Annual Photo Contest a success. We appreciate the generous support of our prize sponsors and we thank them for their participation.

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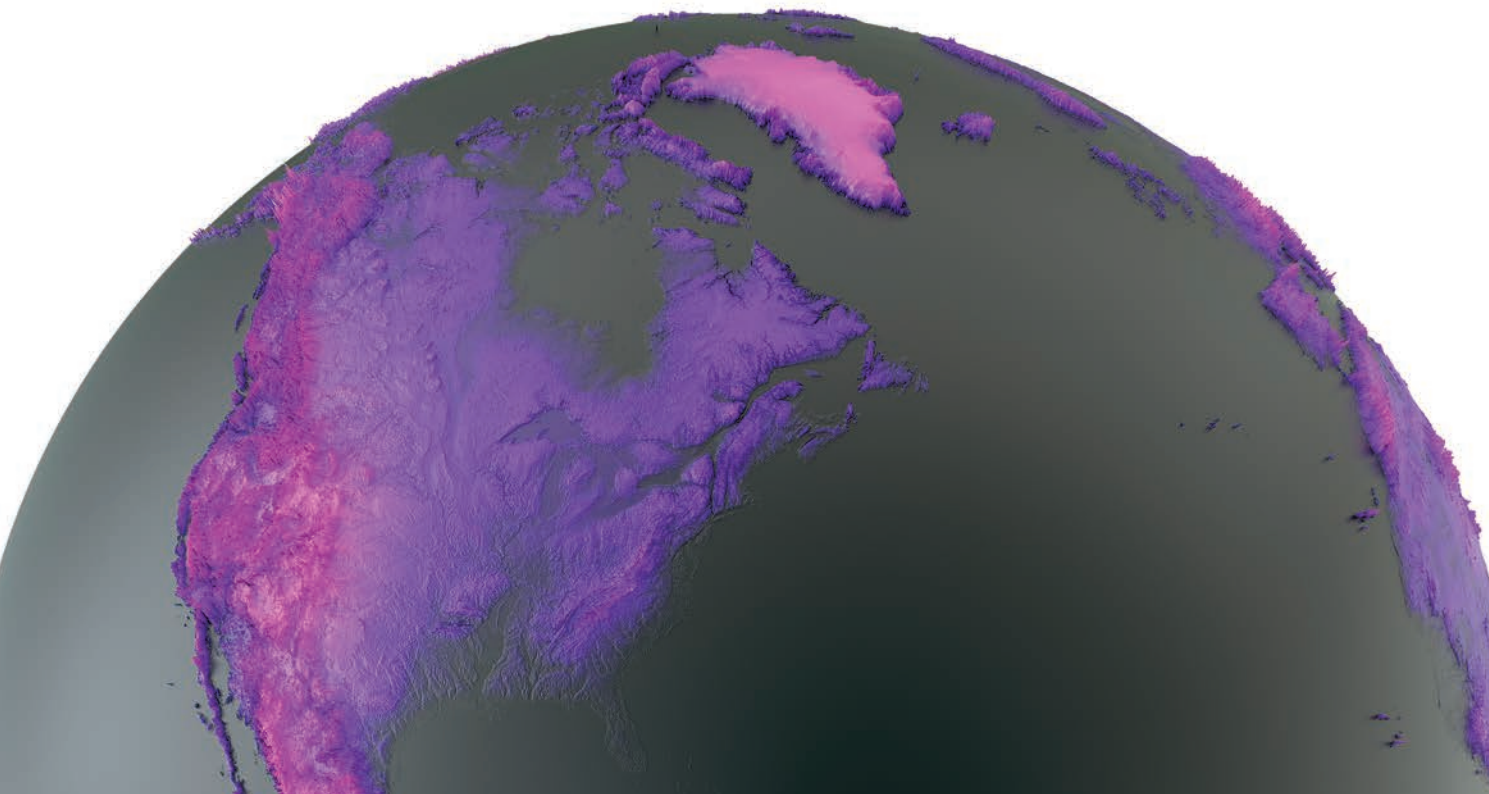
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COMMENT

Your feedback

The wonder and woe of the wolf

I wanted to share our family's story of the wolf ("The Big Bad Wolf?" January/February). We had a small cottage on a lake in the Muskoka region of Ontario, and early one morning, my husband and I were awoken by loud howling. Since our dog was cowering at the side of the bed, we surmised something threatening (to her, at least) was around. When we opened the window and looked out, we beheld a breathtaking spectacle — a wolf standing not 100 metres from the house, howling at the setting moon. It sensed our gaze, turned its yellow eyes in our direction and studied us.

Over the years, that wolf promenaded its pups in full view of our cottage and came close to our campfires by the lake, but never once threatened us. We had a healthy respect for its strength, but we also developed an abiding love of wolves. It's been more than 30 years since that first encounter, but all the pictures in this story took us right back to that time.

Mary-Anne Brabander
Bracebridge, Ont.

Interesting timing for your feature article on the wolf, with the B.C. government currently pursuing culls throughout the province (with the same happening in Sweden and who knows where else). The wolves have been made the scapegoat for declining caribou populations, when any reputable expert in the field will tell you that the declining herds are

due to habitat destruction and mismanagement. Perhaps we should learn to control our own population, and greedy, irresponsible resource extraction, instead of shooting these highly intelligent, beautiful creatures to keep caribou hunters happy. A sad (and embarrassing) day for British Columbia.

Patrick Caraher
Vancouver

National Bird Project kudos

I want to commend you and your team on a great idea with the National Bird Project ("The National Bird Project," January/February). I was really excited when I saw it in the wildlife issue, and it was news to me that we don't have that emblem. Good show!

Stewart Britton
Belleville, Ont.



A whale of a tale

Incredible ("A humpback is born," January/February). I have been within arm's reach of these beauties in the Bay of Fundy. I was in awe, and these photos [by Mike Beedell] bring that feeling right back. Bravo!

Samantha Leeming
Truro, N.S.

Correction:

In "Das boat" (Spring 2015, *Canadian Geographic Travel*), Jeremy Van Dyke was mistakenly named as the owner of travel company Journeys by Jerry Van Dyke. In fact, Jerry and Anneka Van Dyke are the company's owners.

COVER VOTE

How we chose this issue's cover



Bears traditionally sell well as *Canadian Geographic* cover subjects. And finding cover-worthy images of the predator is often easy, as was the case landing on an amazing picture of a grizzly for this issue. Indeed, the entire team agreed the image (by photog Don Johnston) was a winner. So in our cover vote for this edition, we presented three different treatments of cover lines on the same picture. The results were as close as ever. Fortunately for all involved, option three, the staff's consensus favourite, was also the winner of the online vote, garnering 38 per cent of the tally (option one got 36 per cent, while option two nabbed 26 per cent). Like voters, the *Canadian Geographic* team felt the treatment of the main cover line "GRIZZLY" was particularly impactful, and combined well with the great direct eye contact of the bear. Add some bold hits of red and you've got an eye-catching cover that should stand out.



Not already receiving our cover vote email? Visit cangeo.ca/newsletter and sign up for the *Canadian Geographic* newsletter to get in on the action.

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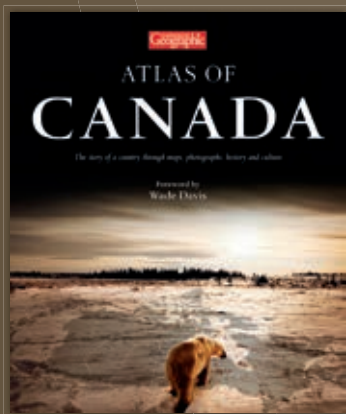
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TRENDING

The buzz from CanGeo's social media sites

Canadian Geographic's National Bird Project (nationalbird.cangeo.ca) has really, *ahem*, taken flight. More than 25,000 votes have been cast thus far, and we've received thousands of comments in support of specific species. Here's a selection of highlights from the feedback.

The snowy owl (RIGHT) is majestic, profoundly beautiful, silent but strong. Sounds like Canada to me.

—Brenda Trieber

I grew up along the shores of the Fraser River, in British Columbia, where the presence of the great blue heron was everywhere. Everything about them is majestic, from their colour to the plume on the top of their heads.

—LaDonna Quinn

[The gray jay] is a distinctive, smart, friendly bird found in every province. It was formerly called the "Canada jay," and is found here year-round; the majority of its range is in Canada.

—James Kamstra



The chickadee is the quintessential Canadian bird. It stays all winter (unlike many other birds), it's found across the country and it sings on the nicest days of the year, all year. I can hardly imagine a bird that better captures the spirit of our people than the chickadee.

—Adam Ford



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PULSE

The geography poll

How walk- and bike-friendly is your neighbourhood?

80%

I don't even need a car

11%

I'm within walking or biking distance of a grocery store

4%

There are sidewalks, but they're rarely used

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WHAT'S THIS?

Recognize this mystery object and how it relates to Canadian geography and history?



- Visit cangeo.ca/whatsthis for a hint, to enter your guess and for a chance to win one of five copies of *Canadian Geographic's* special 2015 bird issue.* Follow @CanGeo for more hints.
 - The deadline is May 11, 2015.
 - The correct answer will appear in the June 2015 issue.
- * Five winners will be randomly selected from all correct responses.

Canadian Geographic and the Canadian Heritage Information Network have partnered to showcase important artifacts from Canadian history and geography. Each object comes from a museum across the country that is part of CHIN's network.

LAST ISSUE'S OBJECT: *Ruppia* ball

Ruppia, or widgeon grass, is one of the few species in the plant world known to form "sea balls" or "lake balls." These formations can be as small as baseballs or as large as watermelons. The lake ball pictured here was found floating in



Shawnigan Lake, B.C., in 1981, although it didn't form there; someone driving through the area stopped and dropped it into the water — a reminder that the history of an object isn't always immediately apparent, despite the environment in which it was found.

With files from the Shawnigan Lake Museum. Learn more about this artifact and others in the museum's collection at shawniganlakemuseum.com.



Explore more stories from Canada's past through cangeo.ca/whatsthis.

LEFT: © PARKS CANADA/DW RODGER; RIGHT: COURTESY SHAWNIGAN LAKE HISTORICAL SOCIETY

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WHERE'S THIS?

Identify this landmark using the following three hints

1. Scientists who worked at this institution have been credited with discovering insulin, the first radiation treatment for cancer and creating an HIV vaccine.



2.

3.



- ▶ Need a clue? Visit cangeo.ca/wheresthis for another hint, then enter your guess for a chance to win a copy of the new *Canadian Geographic Atlas of Canada*.*
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- * Five winners will be randomly selected from all correct responses.

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YOUR SOCIETY

NEWS FROM THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY



Erebus medallists show off their awards at the Erebus Reception, which took place at the Royal Ontario Museum on March 4.

HONOURING EREBUS

"I will never forget, and I don't think Canadians — nor anyone in history anywhere in the world — will ever forget those first ghostly images of *Erebus* preserved on the bottom, nearly whole, in icy perfection as if by an act of God."

That was Prime Minister Stephen Harper during the March 4 Erebus Reception at Toronto's Royal Ontario Museum, reminiscing about the historic moment in the summer of 2014 when one of the lost ships of Sir John Franklin's 1845 Arctic expedition was located on sonar.

The reception, hosted by The Royal Canadian Geographical Society, was a celebration of the find and the partners of the 2014 Victoria Strait Expedition. Among the 200-plus attendees were federal Finance Minister Joe Oliver, British Consul General Kevin McGurgan, U.S. Consul General James Dickmeyer and Toronto Mayor John Tory. Canadian folk singer-songwriter James Keelaghan was on hand to perform the traditional *Lady Franklin's Lament* and Stan Rogers' beloved *Northwest Passage* to open and close the event.

Paul Ruest, president of the RCGS, and John Geiger, the Society's CEO, presented the first of the new Erebus Medals to the prime minister and his wife Laureen Harper. The leaders of all parties involved in the 2014 search were also each awarded the medal (see "Erebus Medal recipients," right). In all, 220 people have received the medal for their contributions to the success of the search (to see a full list of Erebus medallists, visit rcgs.org). "We recognize the find as a great moment," said Geiger, "not only in underwater archeology, or in Arctic science, or even in exploration history — but a great moment for Canada."

Besides a renewed search for Franklin's other ship, HMS *Terror*, the expedition is far from over. "Tonight we celebrate, but soon the work will begin again," said the prime minister. "In fact, I'm pleased to announce that we're getting an early start, that this year's exploration will begin next month [April], to start unlocking the secrets of *Erebus*. We will begin dives beneath the ice this spring."

EREBUS MEDAL RECIPIENTS

Prime Minister Stephen Harper
and **Laureen Harper**

Alan Latourelle, CEO, Parks Canada

Andrew Campbell, Vice-President,
External Relations and Visitor Experience,
Parks Canada [at time of 2014 expedition]

Marc-André Bernier, Chief, Underwater
Archaeology Service, Parks Canada

Ryan Harris, Lead diver, Underwater
Archaeology Service, Parks Canada

Rear-Admiral John Newton,
Royal Canadian Navy

Commissioner Jody Thomas,
Canadian Coast Guard

Denis Hains, Hydrographer General
and Director General, Canadian
Hydrographic Service

Scott Youngblut, Hydrographer-in-charge,
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HONOURING EREBUS



Clockwise from top: (from left) Paul Ruest, president of the RCGS, Prime Minister Stephen Harper, Lauren Harper and John Geiger, CEO of the RCGS; Finance Minister Joe Oliver and RCGS Fellow Tom Kierans; musician James Keelaghan; Louie Kamookak, an Inuit oral historian, and his wife Josephine.



FRANKLIN FILM WORLD PREMIERE

The world premiere of *Franklin's Lost Ships*, the documentary about the 2014 discovery of Sir John Franklin's *Erebus*, will be in Calgary on April 8. The film features re-enactments of the *Erebus* crew's failed attempts to survive the Arctic, and draws on a roster of experts on the disastrous 1845 Franklin expedition, including Marc-André Bernier, chief of the Parks Canada Underwater Archaeology Service that made the find, and John Geiger, RCGS CEO and co-author of *Frozen in Time: The Fate of the Franklin Expedition*.

Co-produced by Gordon Henderson's Toronto-based 90th Parallel Productions and the U.K.'s Lion TV, *Franklin's Lost Ships* will air across Canada on CBC's *The Nature of Things* on April 9 at 8 p.m. EST, on NOVA (PBS) in the U.S. and Channel 4 in the U.K.

—Nick Walker

SPEAKER SERIES: JAMES RAFFAN

It took James Raffan 1,095 days to circumnavigate the globe at the Arctic Circle, and on April 15 at The Royal Canadian Geographical Society's Speaker Series event in Ottawa, he'll recount that adventure in just two hours, sharing stories from his latest book, *Circling the Midnight Sun: Culture and Change in the Invisible Arctic*. Don't miss the chance to hear Raffan's warm-hearted and impassioned report on how people who live across the circumpolar world are trying to adapt to the enormous changes happening there. Purchase tickets for the event at rcgs.org.

—Sabrina Doyle



CANADIAN GEOGRAPHIC CHALLENGE



Alex Trebek hosting the Great Canadian Geography Challenge in 1996.



NEW TILED CIRCUMPOLAR MAP

Through a generous donation from Shelagh Grant and Jon Grant, CG Education has produced a printable tiled circumpolar map, a complement to the Arctic Imperative resource package created in 2014. This is the third tiled map produced by CG Education, which had earlier created the First World War and Canada tiled maps. Download the new tiled map at education.canadiangeographic.ca.

CG IN THE CLASSROOM: NATIONAL BIRD PROJECT ACTIVITIES

There are more than 450 species of birds across Canada, but not one has been designated as our national bird. The National Bird Project aims to change this. Engage students by hosting debates on which species should win and encourage them to submit essays on the bird of their choice at nationalbird.cangeo.ca.

CLASSROOM ENERGY DIET CHALLENGE

With the Classroom Energy Diet Challenge underway, Canadian students are learning to cut their energy use. Classes compete for a portion of \$40,000 in prizes by completing challenges focused on energy conservation, community engagement and green innovations. Follow along at energydiet.canadiangeographic.ca.

CANADA'S COOLEST SCHOOL TRIP

Parks Canada wants to help young people explore significant places around Canada, and one lucky Grade 8 class's one-minute video submission will win them an all-expenses-paid trip to La Mauricie National Park and Quebec City. Vote for the entry you think should win and learn more at contest.myparkspass.ca.

—S.D.

Twenty of Canada's brightest geography students will compete in the 20th Canadian Geographic Challenge in Ottawa this May.

The competition will be live and in-person for the first time since 2002 (in recent years it has been held online) thanks to a US\$100,000 donation from Alex Trebek, host of *Jeopardy!* and a Royal Canadian Geographical Society Fellow and Gold Medallist.

"I wanted to do something for the Canadian Geographic Challenge, and thought it would be much better to reward the kids by bringing them to Ottawa to compete in person," said Trebek, who has hosted the Challenge in previous years. "It would make them feel special and let them mix with other kids and talk about geography."

By mid-February, more than 500 schools had registered for the level one (grades 4 to 6) and level two (grades 7 to 10) competitions, said Beth Dye, chair of the CG Challenge Committee and a Governor of the RCGS.

The level one and two champions from each school will receive CG Challenge medals. Level two champions will go on to write a provincial test that determines the top 20 students across Canada, who will compete in the final in Ottawa.

The first stage of the final will be private and see students complete fieldwork and a test. Based on these results, five students will be selected to compete publicly on May 4 at the Canadian Museum of Nature.

Trebek will be in attendance and will present awards.

"I'm thrilled that we're able to bring our top geography students to the nation's capital to engage in an opportunity to demonstrate their understanding of geography," Dye said. "Alex Trebek has been an incredible supporter of our Challenge."

Also this year, Google is supporting the Challenge for the first time.

—Carys Mills



Follow along with this year's Canadian Geographic Challenge by visiting canadiangeographic.ca/challenge.



THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY

Founded in 1929, the Society is a non-profit educational organization. Its object is to advance geographical knowledge and, in particular, to stimulate awareness of the significance of geography in Canada's development, well-being and culture.

Primary fields of interest include our people, resources, environment, heritage and the evolution of our country. In short, the aim is to make Canada better known to Canadians and to the world. *Canadian Geographic*, the Society's magazine, is dedicated to reporting on all aspects of Canada's geography — physical, biological, historical, cultural and economic — and on major issues of concern to Canada in which geographical dimensions play a significant role.

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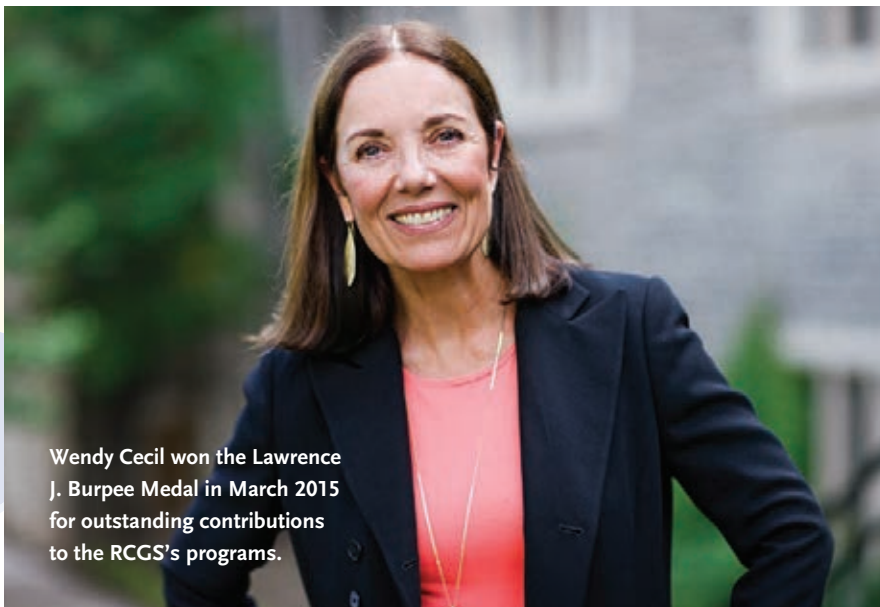
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YOUR SOCIETY | FELLOWS NEWS

FEATURED FELLOW: WENDY CECIL



Wendy Cecil won the Lawrence J. Burpee Medal in March 2015 for outstanding contributions to the RCGS's programs.

Wendy Cecil is a Toronto-based philanthropist and the former vice-president of business development at Brascan Ltd. (now Brookfield Asset Management). She is chancellor at Victoria University, vice-chair of the St. Michael's Hospital board of directors and chair of the Li Ka Shing Knowledge Institute, but her commitment to public service has seen her dedicate her time to numerous other organizations as well, including the Canadian Merit Scholarship Foundation, the Toronto Reference Library and the Royal Ontario Museum. In November 2014, she was elected to the RCGS's Board of Governors. Here, Cecil shares her thoughts on public service and her goals for the Society.

On her public service and philanthropy

It started when I was a kid. I grew up in a family of four in Willowdale, a little post-war Toronto suburb. My parents were not wealthy or connected, but they were really active in the community. So I learned that you should get involved and try to make things better. Through it all, I've made great friends, met fascinating people, learned so much and have felt very valued and rewarded. I've had friends who've asked me, "Why don't you just relax?" That's just not my idea of fun.

On what she hopes to achieve as a Society governor

Many of us want to see more women honoured by the Society. Making the Society much better known by all Canadians is also important because we're a nation very much defined by our geography. Understanding Canada's geography is both exciting and essential if we're to hold ourselves together. I think it starts with kids. The giant floor map program is fabulous, and is really planting the seeds for people who are going to be excited about the country's geography. I remember my Grade 10 geography teacher always said, "Geography determines everything." I grew up with this in my mind and I still agree.

—Michela Rosano



2014 HONOUR ROLL

The Royal Canadian Geographical Society expresses its most sincere appreciation to all of our donors for their generosity and commitment to supporting geographic learning in Canada.

We are proud to recognize the following individuals for their outstanding contribution to the Society.



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next issue

JUNE 2015

Canadian Geographic
celebrates great
modern-day explorers



Famed underwater explorer Joseph MacInnis (TOP) gave the definition of exploration that helped refine our list of Canada's greatest modern-day explorers, which includes adventurers (ABOVE), field researchers and scientists.

"Exploration is a very hard word to unravel," wrote Joseph MacInnis, the renowned underwater explorer, when in early 2015 *Canadian Geographic* contacted him, along with numerous other well-known explorers and experts, to help the magazine compile a list of great modern-day Canadian explorers for the June 2015 issue. Indeed, defining the term was critical to creating the list. MacInnis said he'd struggled with a definition for exploration since his first expedition in 1964, but recently landed on one he really likes: "Exploration is about forging dramatic new relationships with the natural world and telling essential stories to accelerate our understanding of the critical importance of these relationships." Our staff liked it, too, and this interpretation became a guiding principle behind our selections — a tough task, with plenty of debate, rest assured. In essence, we've produced a list of living Canadian explorers who have accomplished world firsts, made indisputably significant discoveries or had undeniable lasting impacts — traditional explorers, adventurers, field researchers and scientists among them. Check out the next edition to find out who made the cut.



Subscribe or renew today by visiting cangeo.ca/subscribe or by calling (800) 267-0824. The June 2015 issue hits newsstands May 25.

TOP: COURTESY JOSEPH MACINNIS; BOTTOM: ERIK BOOMER/CC ARCHIVES

our country

REVEALING CANADA



Tanya Tagaq

The 2014 Polaris Music Prize winner relishes the feeling of freedom and release she finds around Pond Inlet, Nunavut



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The hoodoos on Bylot Island, just across from Pond Inlet, are the most beautiful place I've ever been. My mother was born and raised in Pond Inlet, on the land, in igloos and sod houses. Our family was relocated by the Canadian government in the 1950s. That was a very difficult thing for everyone. So Pond Inlet is our uninterrupted homeland, where we were happy, where we were surviving, where we were supposed to be. There's a purity to it, a kind of pre-colonial sweetness. When I travelled there for the first time, I felt a very deep connection to it.

The hoodoos themselves are outstanding. They're pillars of sandstone that are strong enough to stand on but soft enough that you can carve your name into the rock with your fingers. There was nothing running through my mind when I wrote my name on one of them, and that's the beauty of being in a place that's magical, cleansing and astoundingly beautiful — your neuroses disappear. When you're in a big city, you're crossing the street and you look and there are 500 cars and 50 people walking by and you've got to get somewhere before three o'clock and blah blah blah ... all that's gone up there. It's a release of every stress when you're out on the land. It's like that peaceful feeling you have when you wake up but your eyes are still closed, and there's just a couple of seconds before everything piles on you and you have to get up. I feel like that all the time when I'm there.

—As told to Harry Wilson

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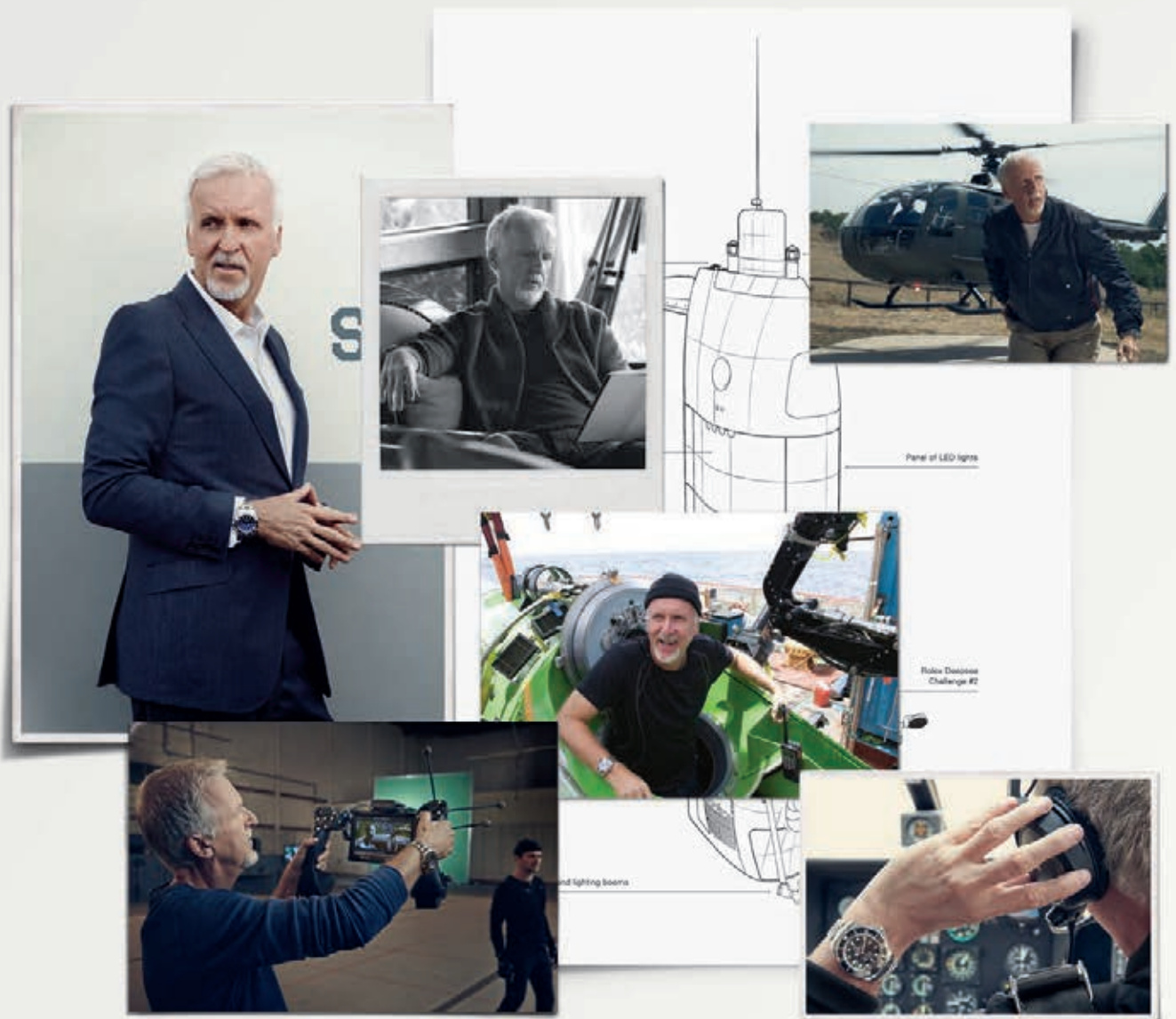
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